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SHOP EQUIPMENT REVIEW

Semi-Annual Resumé of machinery, tools, mechanisms, parts, and materials described in the Shop Equipment News sections of the American Machinist during the last six months of 1930, and also a similar resumé of the Engineering Workshop Equipment sections of the European Edition for June, 1930, to November, 1930, inclusive

UNPRECEDENTED developmental activity among machine tool builders and manufacturers of accessory equipment reflects itself in an all-time record set by this fifteenth semi-annual review number. In it appears a total of 600 items. The increase in the American section alone amounts to 11 per cent over the next best six-months period, that during which the last National Machine Tool Builders' Exposition occurred. Moreover, the section contains 37 per cent more items than the average of the previous five review numbers.

Whereas six months ago the two offerings for the use of tungsten carbide were confined to lathes, the period under review finds six such machines distributed among four classes. They are: a diamond or tungsten-carbide boring machine for pistons; an improved model of the hydraulic lathe mentioned in the last review; an engine lathe with spindle speeds to 3,000 r.p.m. as standard, and obtainable with spindle speeds to 4,400 r.p.m.; a milling machine with spindle speeds to 1,000 r.p.m.; a duplex, automatic, milling machine for incorporation in production lines; and a planer having capacity for work 12 ft. wide, 10 ft. high, and 30 ft. long, and having table speeds to 120 ft. per min. and higher.

By no means, however, are general refinements confined to the above machines. Applications of hydraulic feeds are very plentiful, there being eighteen distinct equipments: two special-purpose boring machines, two drilling machines, a gear generator, two internal grinders, two surface grinders, a cylinder-block lapping machine, two lathes, a milling machine, four broaching machines, and a metal-scrap press. Continued refinement is proceeding in the matter of materials employed for machine castings and other machine elements. V-belt drives, heat-treated alloy steel gears, lubricating systems, ball and roller bearings, and more convenient controls are becoming so common as to be expected by the purchaser.

In none of the developments mentioned is there a tendency toward freakish design; they are all products of conservative, experienced concerns. The trend is toward more carefully built, more complete, and more expensive machines, which, although they will justify their cost in many shops, cannot be purchased by the great numbers of small concerns. For the latter, a great variety of improved equipment following more conservative designs is likewise reviewed. Worthy of note, however, is the present realization by several strong companies that light-duty versatile machines are definitely needed, and several lines are now coming on the market.

Among the boring machines is a horizontal, duplex type having a central, slidable fixture—intended for boring parts to close limits on a production basis. Semi-automatic hydraulic feed is applied to one upright drilling machine. Three upright, station-type drilling machines indicate the growing acceptance of this class of tool.

Roll grinders have been brought out by two companies to meet the varied and exacting requirements of several process industries. Bores up to 50 in. in diameter by 6 ft. long can be undertaken on one hydraulically driven internal grinder, being particularly suitable for Diesel-engine and air-compressor cylinders. Another internal grinder will handle ball bearing races to 21 in.

Besides the two lathes for tungsten carbide, there is another lathe influencing modern practice, a form-turning type fitted with electric controls, so that a master templet can be followed without greater deviation than 0.001 in.

Of the milling machines offered, the manufacturing type predominates. All have spindle speeds for tungsten carbide. By means of a transcribing instrument, the ordinary vertical miller can be set-up cheaply for die-sinking operations. Another important development in this class of equipment is the unit milling head.

All presses show stronger construction and greater use of ball and roller bearings. Steel frame castings are coming in again for these units, and some manufacturers are carrying on with steel-plate construction. Four-crank platen construction of one press prevents cocking in the pressing of large automobile body sheets. Shells 24 in. in diameter can be drawn to 24 in. in depth in $\frac{1}{8}$-in. stainless steel on one long-stroke reducing press employing unique construction. Another larger model makes possible redrawing shells to 72 in. in depth.

Greater convenience in operation and more sensitive construction are found in a production-type dynamic balancing machine for crankshafts, the sensitivity being to 0.05 oz.-in. Straightening and forming of sections from the corrosion-resistant metals have received attention, one straightening machine having more rolls than usual in order to produce accurate straightening in one pass, ordinarily difficult with these materials.

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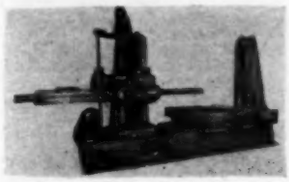
Boring and Turning Machines

Boring, Milling, and Drilling Machines, Horizontal, High-Speed

Jones Machine Tool Works, Inc., 5300 Lansdowne Ave., Philadelphia, Pa. [Vol.73,p. 222.] 85.

Table sizes are 25x50, 30x60, 36x72, and 40x80 in. Anti-friction bearings are used throughout. Spindle feed is by a screw and nut. A safety stop and automatic knockout prevent jamming. Safety stops are also



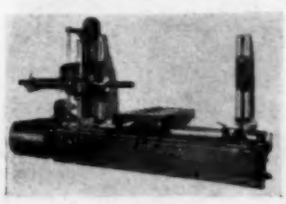
provided for the table and the saddle. All feeds, speeds, and traverse movements can be reversed instantly through a twin-disk clutch.

Specifications: diameters of spindle: 3, 3½, 4½, and 5 in., longitudinal spindle traverses, in two steps, 40, 48, 60, and 72 in.; maximum distances, faceplate to outer support, 72, 84, 96, and 108 in.; maximum distances from top of table to center of spindle, 30, 35, 40, and 45 in.; cross feeds to table 36, 46, 58, and 66 in.; power longitudinal feeds of table, 44, 50, 56, and 62 in.; number of speed changes, 24 in all cases, ranges of spindle speeds, 11-720, 10-650, 8-520, and 6-400 r.p.m.; rapid traverses per minute, 84 in.; weights, from 16,000 to 34,000 lb.; power required, 5 to 15 hp.

Boring Machine, Horizontal

Lambert Machine Tool Co., Bucyrus, Ohio. [Vol.73,p.1024.]

A 4-in. boring bar with a travel of 30 in. is employed. Maximum distance from the faceplate to the outer support bearing is 84 in. The head has a vertical power feeding movement of 30 in., and the cross and longitudinal power feeding movements of the table are 40 and 60 in. A range of 24 feeds is available, varying from 0.004 to 0.250 in. per revolution. This machine is thus adapted for cutting right-handed or left-handed



threads in various pitches, beginning with four threads per inch.

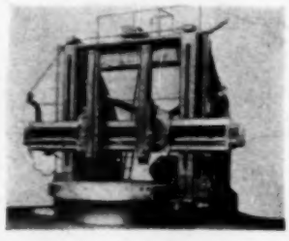
Either motor or belt drive may be employed. The bar may be rotated at speeds from 7 to 216 r.p.m. in either direction. Remote control is provided. The approximate weight of the machine is 16,000 lb.

Boring Mill, 10-Ft.

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.73,p.379.]

The table is now driven by an internal spur gear driven in turn by hardened spiral bevel gears. Mounting of these spiral bevel gears is of the ball-bearing type.

Table track and spindle are lubricated by a pump, which circulates oil to all of the units as well as to the speed box. Drive from the motor to the speed box is through herringbone gears. Movement of the head is controlled by push buttons.



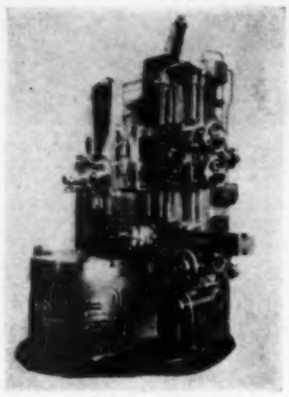
Small motors mounted on each end of the rail and interlocked with the feed supply the rapid traverse or the feed to the heads. Heads are independent of each other. The rail is raised and lowered by another motor controlled by push button. Side heads can be supplied.

Boring Mill, Side-Head, 42 to 50-In.

Niles Tool Works Co., Hamilton, Ohio. [Vol.73,p.756.]

This 42- to 50-in. model employs a one-piece base and column machined on a special tool to insure accuracy. The cross-rail has a three-track bearing surface with a narrow guide for the vertical head saddle.

Bearings of the square-lock type are provided for the vertical head, with taper gib adjustments in all directions. The side head is an entirely independent unit attached directly to the column. Both heads have rapid traverse. Operation is at 120-in. per min., irrespective of feeds or table speeds. Sixteen feeds are provided for both the rail head and the side head. These feeds range from 0.004 to 0.750 in. per revolution of the table. Both heads are



fitted with large micrometer dials, as well as graduated scales and observation stops. The table change gearbox provides twelve speed changes ranging from 3.2 to 70 r.p.m.

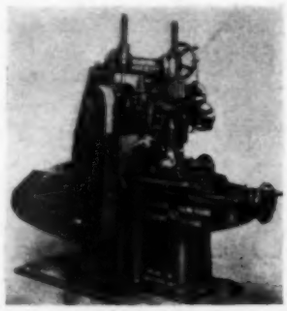
Boring Machine, Jig and Toolroom, Model MP-3C, Societe Genevoise

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol. 73,p.980.] 467.

Guaranteed accuracy of the table and boring head slide movement is ±0.0002 in. for the Model MP-3C toolroom jig boring machine. This machine is manufactured by Societe Genevoise d'Instruments de Physique.

The machine is especially suitable for instrument making, die making, construction of small jigs and fixtures, model making, and development work. It is also useful in the shop as a general measuring machine.

Table area is 15x20½ in. Free distance between the uprights is 23¼ in., transverse motion of



the boring head, 12 in., table movement, 18 in.; working area, 1x1½ ft. Vertical travel of cross-rail, 9½ in., minimum distance from the table to cross-rail, 5 in., vertical capacity, 14½ in.

It is possible to obtain eight speeds for the spindle, varying from 135 to 1,500 r.p.m. The machine is suitable for drilling in cast iron up to 1 in. and boring to 2¼ in. For drilling small holes, ¼ or ⅛ in., a holder for guide bushings is supplied. A circular table can be furnished with a diameter of 13¾ in., and a height of 4¾ in.

Net weight, 2,150 lb., not including the motor; height, 6 ft. 4 in.; over-all length, 58 in., and width, 51 in.

Boring and Tapping Machine, Duplex, Hydraulic

Baker Brothers, Inc., Toledo, Ohio. [Vol.73,p.303.] 120.

The heads of this machine can be made special with single or multiple spindles, or designed so that tapping operations can be performed. These heads have a multiple V-belt drive, and each has an independent motor. To secure the desired tapping lead from the hydraulic feed mechanism, each head is fed against a retarding cam, made in two pieces so that change-overs to different tapping leads can be effected quickly.

A separate gear pump is provided for each head, together with a direct-connected motor. Entirely automatic operation is another feature, the main spin-

dle drive having electrical control.

Ball bearings and forced-feed lubrication are used throughout. A 15-hp. motor is used for each main drive, and a 3-hp. motor for each hydraulic pump.

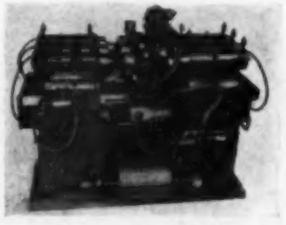
Weight, 20 tons.

Diamond Boring Machine, Horizontal

Ex-Cell-O Aircraft & Tool Corporation, 1236 Oakman Blvd., Detroit, Mich. [Vol.73,p.717.]

Boring to close limits of such parts as pistons, connecting rods, cluster gears, and interchangeable main-line bearings on a production basis can be done on the Ex-Cell-O horizontal, diamond boring machine, using either tungsten-carbide or diamond tools. The design is such that both rough-boring and finish-boring operations can be accomplished on the same machine with a single loading and a single fixture.

Finish boring may be accomplished with suitable fixtures, by boring at one end of the machine while loading a new pis-



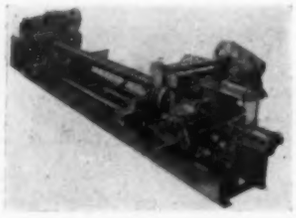
ton or rod at the other end, or such parts may be rough-bored at one end and finish-bored at the other end. Floor space required is approximately 14 sq.ft., and the weight is approximately 6,600 lb.

The table has a central, finished, fixture pad measuring 20x25 in. and having T-slots. Maximum table stroke is 16 in. The spindles may be adjusted lengthwise and across the machine.

Boring, Hollow Milling and Threading Machine, No. X-20, for Cast-Iron Gas Pipe

Moline Tool Co., Moline, Ill. [Vol.73,p.755.] 347.

Whereas calking is the usual manner of assembling cast-iron gas pipe, by means of the No. X-20 pipe machine, such pipe may be machined for screwing together. This special machine will ream, hollow mill, tap, and thread the bell and spigot ends



of 5-, 7-, and 9-in. pipe from 6 to 16½ ft. long.

Two saddles are carried on the structural steel bed. The left-hand saddle is located permanently on the bed, whereas the right-hand saddle is adjustable for different lengths of pipe. These two saddles carry spindle units on double V-bearings, and the spindle units feed in to give the travel to the tools. Quick traverse of the feed is derived from the oil pump units on either end. Between the two spindle units are cross heads carrying the work fixture. The pipe is held in a clamping fixture known as a "cat-head." The cross heads have their traverse movements controlled by air.

Boring Machine, Horizontal, Three-Spindle, "Newton"

Consolidated Machine Tool Corporation of America, Rochester, N. Y. [Vol.73,p.899.] 437.

This machine consists essentially of a heavy bed plate on which are mounted three boring heads carrying the three boring spindles. Two heads carry 10-in. spindles and are adjustable horizontally at right angles to the spindle travel, whereas the head carrying the 6-in. spindle is adjustable vertically.

The bed plate is provided with ways for the work table,

the latter being provided with power adjustment in line with the spindle travel. Outboard supports for the boring bars are mounted on the work table, and are provided with horizontal and vertical adjustments.

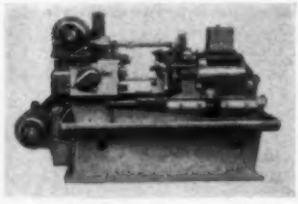
The entire roughing cut is taken with one pass of the boring bar which travels a distance of about one-third of the bore because of the multiple tooling employed. Finishing cuts are taken by single tools.

Control of the feed and rapid traverse is manipulated through air cylinders. Both hand and power independent adjustment is provided for each spindle.

Chucking Machine, Automatic, 8¼ x 8 In.

Goss & De Leeuw Machine Co., New Britain, Conn. [Vol. 73,p.220.] 73.

An intermediate size has been added to the line of tool-revolving automatic chucking machines. This model, the 8½x8 in. size, is identical in design to the other two sizes, namely



6x6½ in., and 11x10 in. The four spindles are 8½ in. apart on centers, and the total feed stroke obtainable is 8 in. Goss & De Leeuw 12 in., two-jaw chucks are standard equipment.

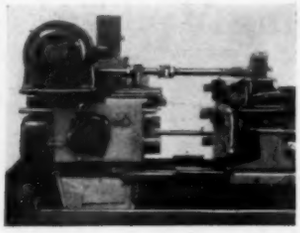
The threading spindle is controlled by a leadscrew in constant engagement, and is driven by an independent reversing electric motor. Up to 480 pieces per hour can be indexed.

The machine weighs 12,000 lb. Main drive is by a 10-hp. motor.

Threading Attachment for Multiple-Spindle Chucking Machines, Electric

Goss & De Leeuw Machine Co., New Britain, Conn. [Vol. 73,p.984.] 469.

Electric reversing drive for the threading spindle of its multiple-spindle chucking machines has been announced by the above concern. The independent drive for threading spindle is furnished by a reversing electric motor, acting through a worm and worm wheel and pick-off gears direct to the spindle.



Starting, reversing, and stopping of the spindle is only a matter of throwing an electric switch rather than operating a mechanical clutch. The instantaneous positive reverse gives assurance that the tap or die will always reverse at the same point, permitting threading close to a shoulder or a blind bottom. Higher spindle speeds can also be attained because of the absence of shock.

Boring Bar Equipment, Direct-Drive

H. B. Underwood Corporation, 1015-1025 Hamilton St., Philadelphia, Pa. [Vol.73,p. 300.] 80.

A constant-speed motor is mounted on top of the unit and drives through a four-speed gearbox to a large gear keyed to the boring bar. Changes in speeds are made by two pins.

Drilling Machines

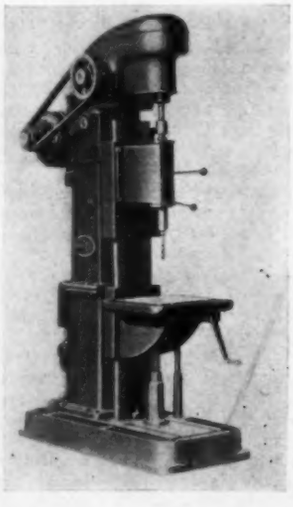
Drilling Machine, Upright Hydraulic-Feed, Single-Spindle, Model B-225-H, "Natco"

The National Automatic Tool Co., Richmond, Ind. [Vol.73, p.30.] 2.

Semi-automatic hydraulic feed with simplified control of the head is featured on the "Natco" Model B-225-H. The base working surface is 17½ in. long by 17 in. wide.

The column is built in two halves bolted together. Either an adjustable knee type or a solid built-in table can be provided. The former has a minimum height of 22 in., with a vertical adjustment of 12 in. Working surface of the table is 16x16 in. The built-in. table working surface is 22 in. long by 20 in. wide and has a height of 22 in.

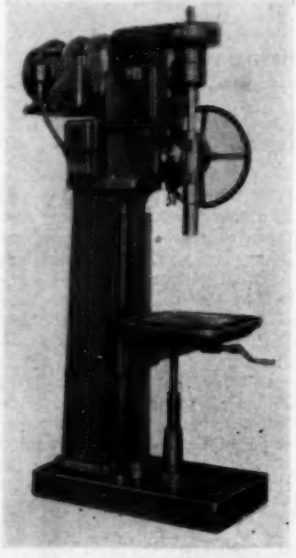
Specifications: Height of machine, 7 ft. 11 in.; center of drive shaft to face of column, 10 in.; height of working surface of adjustable table, maximum, 34 in., minimum, 22 in.; distance from working surface of base to spindle nose, maximum, 46 in., minimum, 34 in.; range of power feed, 0 to 15 in. per min.; floor space, 26x50 in.; weight, 3,650 lb. net., and drilling capacity, 1¼ in. in steel at 75 ft. per min. and 0.008-in. feed per revolution.



Drilling and Tapping Machine, Upright, All-Geared, 1-In., No. S-201

Barnes Drill Co., 814-830 Chestnut St., Rockford, Ill. [Vol.73,p.641.] 304.

The machine has capacity for ⅜- to 1-in., high-speed drills in steel, and the distance from the center of the spindle to the face



of the column is 10½ in. Speed changes can be made quickly to give spindle speeds from 69 to 1,296 r.p.m. Feeds range from 0.0035 to 0.031 in. Geared

thread leading feeds for all tapping work can be provided.

The unit head contains a pump for the self-oiling system. Raising blocks or longer columns can be employed. A No. 4 Morse taper spindle is furnished as standard, but a No. 3 can be had. A 3-hp. motor is direct-connected to the drive shaft, and may be of the flanged type. For tapping, a reversing, multiple-disk clutch gear is added. The table working surface is 14x14 in.

Additional specifications: height of machine, 88½ in.; maximum distance from regular table to nose of spindle, 37½ in.; vertical travel of regular table, 17 in.; floor space, front to back, 44 in.; and width, 20 in.

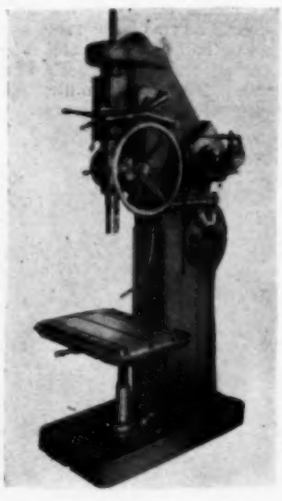
Drilling and Tapping Machine, Upright, All-Geared, Self-Oiled, No. 201¼

Barnes Drill Co., 814 Chestnut St., Rockford, Ill. [Vol.73, p.940.] 429.

Capacity to drill 1¼-in. holes in S.A.E. 1035 steel is found in the No. 201¼, general-purpose, self-oiling, all-geared, drilling and tapping machine. The distance from the center of the spindle to the face of the column is 10 in. Six quick-change geared speeds and six quick-change geared feeds are other features.

The drilling head is a unit, and may be used conveniently in gang style of two to six spindles. The spindle has six splines. Speed change gears are of chrome-nickel steel, heat-treated. Timken bearings are used for all speed change shafts and spiral crown gears.

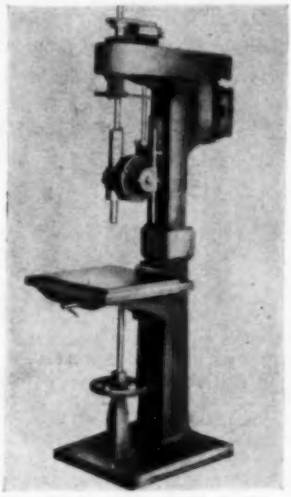
Specifications: Height, 95 in.; maximum distance from table to spindle, 33½ in.; maximum distance from spindle to base, 46 in.; table surface, 15x24 in.; travel of spindle, 12 in.; travel of table, 17 in.; spindle taper, No. 4; floor space, 31x50 in.; weight, with motor and starter, 1,840 lb.



Drilling Machine, Upright, with Power Feed, Type U

Francis Reid Co., Worcester, Mass. [Vol.73,p.943.] 446.

A power feed mechanism has been applied to the Type U drilling machine. Power feed is thrown on or off by a lever,



and also has an automatic knock off. V-belt drive is employed.

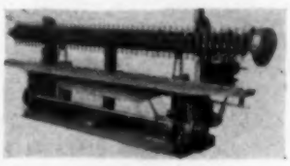
Three feeds are available, 0.004, 0.008, and 0.012 in per revolution. The machine takes ⅝-in. drills and has four speeds, two electrical and two mechanical.

Drilling Machine, Upright, Gang, 14-Ft. No. 8

The Moline Tool Co., Moline, Ill. [Vol.73,p.225.] 84.

Forty-nine spindles are furnished on the No. 8 gang drilling machine. This machine is 14 ft. in length between end spindles. The minimum center distance between spindles is 1½ in.

All the principal members of the frame are made of steel,



excepting the columns which are of cast iron. The base is a flat piece of boiler plate. The table is made of an I-beam. Cross-members welded in place furnish the pads for mounting on the knee. Cast-iron sections are bolted and welded in the center, providing the working face, which is T-slotted. The rail, on which are mounted the spindle heads, is constructed of an H-section welded to a large piece of boiler plate.

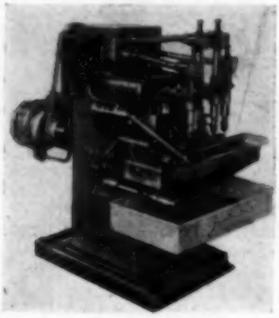
Except for the steel construction described, this is a standard cam-feed machine, with pick-off gears for both the drive and the feed.

Drilling and Tapping Machines, Upright, Four-Spindle, Automatic

Rehnberg-Jacobson Manufacturing Co., Rockford, Ill. [Vol. 73,p.948.] 423.

Two multiple-spindle, universal-joint type machines are being marketed. Each machine is built around the same base, but the drive mechanism differs.

The tapping machine may be adapted for a wide range of work. Drive is by a motor mounted on the rear through V-belts to a gearbox. Power is transmitted to the tapping spindles by means of universal joints and telescoping shafts, final drive being through spiral gears. With this type of drive



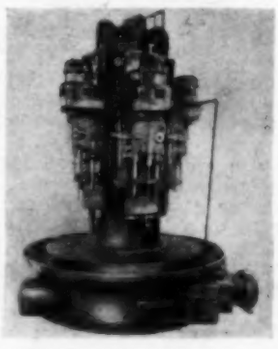
a wide range of spindle spacing is possible. Work is fed automatically from a magazine slide and is raised into the taps by cam action.

In the four-spindle drilling machine, the motor is direct-connected to the gearbox by means of a flexible coupling.

Drilling Machine, Upright, Five-Station, Four-Spindle

Fitchburg Grinding Machine Corporation, Fitchburg, Mass. [Vol.73,p.831.] 348.

This five-station four-spindle machine is operated principally by electric controls and limit switches. Wherever power is required, a motor is applied as close to the demand as possible.



Drillheads can be equipped with multiple spindles for drilling a number of holes at the same time. Fixtures can be designed to hold more than one piece. Drillheads are operated for the down feed and return by a barrel cam rotating in the center of the column. This cam is driven by a two-speed motor through a worm drive. One speed is for the feed and one for the rapid approach and return.

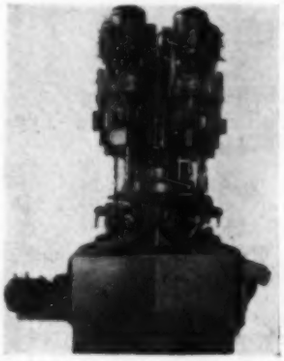
Weight, without fixtures, 40,000 lb.

Drilling Machine, Upright, Station-Type

Vulcan Engineering Corporation, Jackson, Mich. [Vol.73, p.832.] 384.

Station-type upright drilling machines are built with 4, 5, 6, 7, and 8 stations, and with as many additional horizontal or angular side units as necessary. These machines are standard in design and may be changed easily for other work. They are not limited to drilling or reaming operations, but may also be used for tapping and milling. The table is of large size and is easily accessible.

Each unit may be timed for rapid advance and feed, or for various combinations of feeds



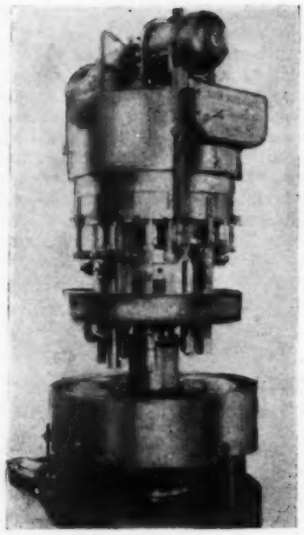
and rapid return, by changing a pair of cams. Indexing as well as the timing for the indexing, is fully automatic and depends entirely on the longest operation used at any one station.

It is also possible to index fixtures automatically between operations. Any individual unit may also be arranged to do several operations by means of indexing the spindles during the time the other operations are being carried on.

Drilling Machine, Upright, Continuous, 8-Spindle

Davis & Thompson Co., 57th Ave. & Mitchell St., Milwaukee, Wis. [Vol.73,p.982.] 470.

Ball bearings are employed throughout. The machine is lubricated automatically, and the



spindles raise and lower automatically. The barrel cam is adjustable, so that the depth of the hole drilled can be adjusted. Spindle speeds range from 50 to 700 r.p.m.

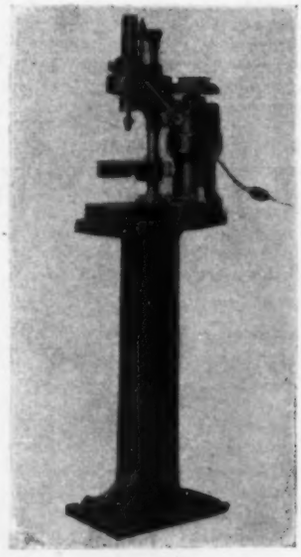
The machine is equipped with a conveyor for conveying the chips out of the pan. A tank in the base is used for coolant, and the tank around the machine is a reservoir for lubricant.

Table slots are for ⅝-in. bolts, and a center guide is bored in the table for locating the fixture. The machine has a capacity of ⅞ to 2 in.

Drilling Machine, Sensitive, Pedestal-Type, Model R-53

High Speed Hammer Co., Inc., Rochester, N. Y. [Vol. 73,p.647.] 300.

Previously, this machine has been available only in a bench type. Features include a three-speed pulley combination designed for spindle speeds of 1,500, 3,000, and 6,000 r.p.m. and the treadle control.



Maximum spindle travel is 2¼ in. The machine will drill to center of a 6-in. circle. Working surface is 4x6 in. The chuck will take up to ¼-in. drills.

Drilling Machine, Sensitive, Bench, Heavy-Duty, 10-In.

Buffalo Forge Co., Buffalo, N. Y. [Vol.73,p.941.] 424.

The 10-in. bench unit is capable of work on a production basis. The table provides a working surface 7 in. square. Drive is by means of a ¼-hp.

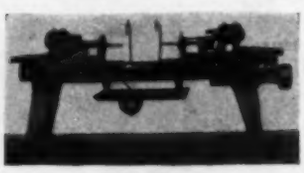
vertical, ball-bearing motor through a 3-step V-belt.

Specifications: Height of drill, 32 in.; capacity, ½ in. in cast iron; spindle speeds, 3,000, 1,750 and 850 r.p.m.; distance from column to center of drill, 5¼ in.; spindle travel, 3¼ in.; maximum distance from chuck to table, 11½ in.; vertical movement of table, 10 in.; and weight with motor, 105 lb.

Drilling Machine, Horizontal, Duplex, No. OO-C

Frew Machine Co., 124 West Venango St., Philadelphia, Pa. [Vol.73,p.71.] 24.

Movement of the heads is mechanically controlled by cams at either end of the bed. Each head has its own motor. A separate motor is provided for the feed. The fixture plate in the center of the bed is provided with T-slots. The camshaft is driven by a worm and



worm gear through a suitable gear reduction and pick-off change gears. Attached to the rear of the head is the cam slide, which is adjustable for varying the distances between spindle ends.

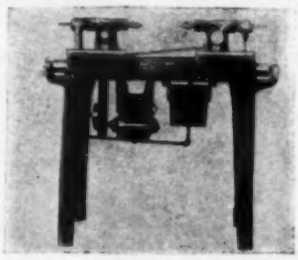
The spindles are supplied with No. 3 Morse tapers.

Drilling Machine, Horizontal, Duplex, ¾-In.

Langelier Manufacturing Co., Providence, R. I. [Vol.73,p. 569.] 252.

This production tool has a distance from the center of the spindles to the table of 6¾ in., and the drilling heads can be adjusted to a working position from 3 in. minimum to 16 in. maximum between chuck ends.

Gibbed T-slots are provided



at each end of the bed for the drilling heads. Spindles are mounted in feed sleeves and can be arranged to run at speeds from 1,200 to 6,000 r.p.m. Adjustable stops are provided on the sleeves. No. 2-A Jacobs chucks are fitted to the spindles.

Drive to the spindles is from belts running over a long jackshaft inside the bed. The jackshaft is driven by a belt from a motor underneath the bed.

Floor space, 50x22 in.; weight, 525 lb.

Drilling and Tapping Machine, Horizontal, Multiple-Spindle

Rockford Drilling Machine Co., Division of Borg-Warner Corporation, Rockford, Ill. [Vol.73,p.904.] 349

A multiple-spindle drilling and tapping machine with functions controlled hydraulically has been developed. Clean cut threads are secured and danger of tap

breakage is reduced to a minimum.

Each head is driven by a ball-bearing motor, the drive being through reduction gears to the main driver at the front compartment of the head which accommodates the spindle unit. Revolving parts are mounted in Timken tapered roller bearings. By means of a clutch lever on each head, speed changes can be secured. Spindles of this machine are built up into separate units.

The machine can be furnished in several sizes, and in many arrangements, such as single-end horizontal, double-end horizontal, three or four-way horizontal, vertical, or combinations of horizontal and vertical.

Drilling Machine, Portable, "Toggle-Bug"

Guibert Steel Co., Pittsburgh, Pa. [Vol.72,p.417.] 180.

A portable drill claimed to equal radial or gantry radial drills in scope of action and economy has been placed on the market. Its trade name is "Toggle Bug," derived from the facts that pressure on the drill point is applied and controlled by means of a powerful toggle, and that the machine is mounted on a buggy or carriage. Power is furnished by a 2-hp., ball-bearing motor geared to a sliding spindle or toolholder, in which the drill bit is held by a

standard tapered socket. The total weight is approximately 1,200 lb.

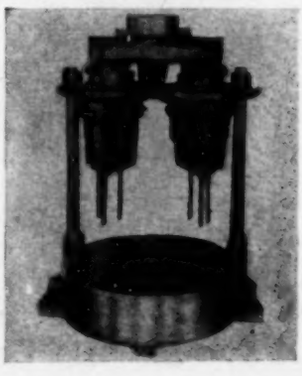
The operator leans or sits on the end of a 5-ft. handle attached to the toggle. The stroke of the drill can be controlled from ⅛ to 6 in. A clutch on the spindle allows the toolholder to be raised or lowered as required.

Drillhead, Duplex, "Cycledriller"

Sellew Machine Tool Co., Pawtucket, R. I. [Vol.73,p.298.] 102.

The "Cycledriller" consists of a double adapter for holding and driving two adjustable drillheads set to operate 120 deg. apart above a revolving table. It has guide rods and a sleeve connection for spindle quills. The spindle units have two radial thrust-type ball bearings and two bronze bushings. Spindles and gearing are of alloy steel, heat-treated.

The closest adjustment obtainable between the spindle is 1.4 in. When four spindles are used, the minimum circle is 1⅞ in. and the maximum circle, 5¾ in. Drills up to ¾ in. can be taken. The revolving table operates on ball bearings, and is self locating and locking for alignment. Tapping spindles have independent clutch reverse.

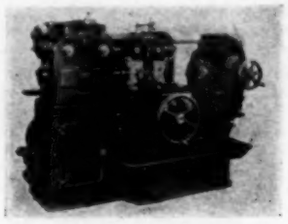


Gear Cutting, Burnishing, and Testing Machines

Gear Generator, Sykes, No. 1-A

Farrel-Birmingham, Inc., 344 Vulcan St., Buffalo, N. Y. [Vol. 73,p.568.] 256.

This machine has a ¼ to 12-in. diameter range and will cut all pitches from 24 D.P. up to and including 4 D.P. Precision is claimed at the high cutting speed of 850 strokes per minute. Besides the cutting of herringbone gears, the No. 1-A is adapted to cutting either straight-



tooth spur gears or single helical gears.

Most gears of a cluster combination can be cut simultaneously. Herringbone gears having a groove in the center of the face can be cut. Two cutters are utilized, mounted face to face.

The bore through the main spindle is 3¾ in. in diameter. Pinions having long shafts, in addition to spline shafts, can be handled easily. Gears integral with crankshafts can be cut and, of course, the machine is adapted for generating cams. Work is fed automatically toward the cutters by suitable increments, variable according to the material to be cut and the total depth of the teeth. The machine is stopped automatically after the work is finished.

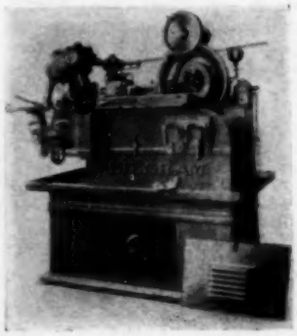
Floor space occupied, 6 ft. x 4 ft. 7 in.; shipping weight, 7,500 lb.

Gear Generator, Bevel

Bilgram Machine Works, Inc., 1217-35 Spring Garden St., Philadelphia, Pa. [Vol.73,p.983.] 480.

This type of machine indexes for the next tooth during every return stroke of the tool, thereby producing bevel gears with uniform teeth. Eight speeds are supplied for 14½- or 2½-deg. pressure angles, or both, if desired. Any pitch diameter or any fractional pitch up to 5 D.P. in steel, and up to 1 in. circular pitch in cast iron, of any ratio up to 6:1 can be cut.

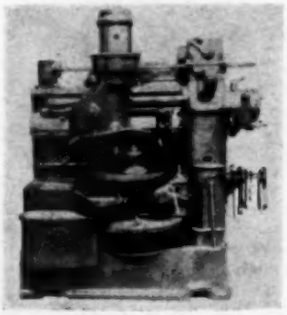
The motor-driven machine requires floor space of 36x61 in., the net weight is 2,750 lb. For belt drive the floor space required is 36x73 in., and the net weight is 2,740 lb.



Gear Shaper, with Modified Saddle, Type 6-A

Fellows Gear Shaper Co., Springfield, Vt. [Vol.73,p.219.]

By limiting the cutting stroke on the 6-A gear shaper to 3 in. instead of 5 in., it has been possible to eliminate the customary cutter-slide and to use a one-piece cutter-spindle similar in design to that used in the high-speed gear shaper. This change in design has increased



the productive capacity, in that it is possible to use the coarser feeds and higher reciprocating speeds.

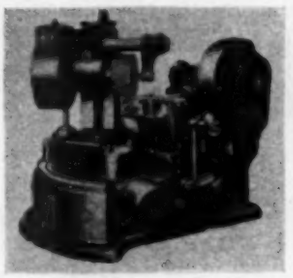
The spindle is made hollow to reduce weight, and so that the counterbalance spring is completely inclosed in the spindle. This makes possible the use of a longer spring working under tension rather than compression.

Aside from the decrease in stroke length, the capacity of this machine remains the same as the regular Type 6-A, which is 18 in. pitch diameter, either external or internal, and 4 D.P.

Gear Shaper, Universal, 18-In., "National-Cleveland"

National Tool Co., Cleveland, Ohio. [Vol.73,p.259.] 97.

This universal gear shaper employs the Simmons method, in which the work and the straight-tooth cutter rotate continuously, while the latter is being fed across the face of the



work, meanwhile being moved intermittently in the transverse direction. On its return stroke the cutter is withdrawn from contact by a cam which actuates the cutter spindle slide. A small amount of metal is removed at each reciprocation.

By the use of a special work-slide, helical gears, either right- or left-hand, of greater helical angles than 45 deg., and single- or multiple-thread worms of cylindrical form or hourglass form, may be cut. A straight-tooth cutter is used.

Specifications of the 18-in. universal gear shaper are: external gears—largest pitch diameter, 18 in.; maximum pitch for external spur and helical gears, 4 D.P. in steel; maximum width of face of spur gears, 9 in.; internal gears, pitch diameters to 11½ in.; cutter reciprocations, 70 to 1,120 strokes per min. in five steps; motor required, 3 hp.; floor space required, 5 ft. x 6 ft. 2½ in.; and net weight, 7,200 lb.

Gear Testing Machine, Bevel, 3-In.

Gleason Works, Rochester, N. Y. [Vol.73,p.335.] 140.

This machine is designed to test running qualities of straight and spiral bevel gears of smaller sizes whose shafts intersect at 90 deg. Bevel gears are tested by running them together in pairs or with a reference gear, to check the cutting machine for correct set-up. Gears are also tested after hardening for both tooth bearing and noise, and to determine if the heat-treatment has made changes that must be compensated for in cutting.

Gears can be tested with or without load as desired.

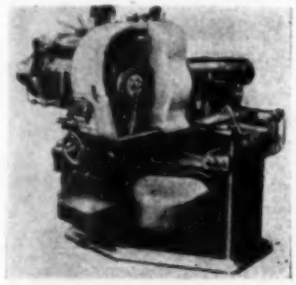
The pinion spindle is power driven, and is operated in either direction by push button control. The pinion head is adjustable horizontally on the frame.

Specifications: Distance from center of drive spindle to nose of brake spindle, ⅜ in. to 3¾ in.; distance from center of brake spindle to nose of drive spindle, ⅜ to 4½ in.; r.p.m. of drive spindle, 3,000 to 4,500; floor space, 26x26 in., and net weight, 550 lb.

Gear Testing and Lapping Machine, Bevel, Hydraulic, 18-In.

Gleason Works, 1,000 University Ave., Rochester, N. Y. [Vol.73,p.642.] 283.

Both spiral bevel and hypoid gears can be tested and lapped on this 18-in. machine. After the gears are placed on the spindles, the machine is entirely automatic in operation. It is hydraulically operated, and the automatic features and timing are electrically controlled. The



automatic control mechanism reverses the direction of rotation of the gears after a predetermined length of time. Time of lapping may be adjusted from 30 sec. to 33 min. per side, and the total time may be varied.

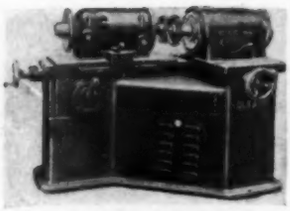
The driven head is mounted on a column adjustable horizontally on the frame. This driven head has a vertical adjustment also to permit lapping hypoids. An adjustable backlash brake, operating on the gear spindle, is provided to maintain an even load during lapping.

Gear Testing Machine, Spur

Gleason Works, 1,000 University Ave., Rochester, N. Y. [Vol.73,p.645.] 284.

Running qualities of spur gears up to 14½ in. pitch diameter can be tested on this machine. The machine can be used for testing cluster gears as well as gears with integral shafts; also helical, herringbone, and internal spur gears. Heads are adjustable horizontally by means of a lead-screw graduated to 0.001 in. A 5-hp. motor drives the spindle.

Specifications: distance be-



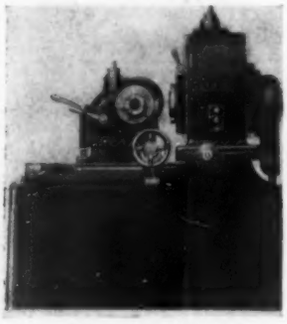
tween noses of spindles on brake and drive heads, min., 3 in., max., 18 in.; distance from center of brake-head spindle to center of drive-head spindle, min., 3 in., max., 10 in.; distance between adjustable tail center and nose of brake-head spindle, min., 0 in., max., 14½ in.; floor space, 61½ by 77 in., and net weight, 4,000 lb.

Gear Testing Machine, Universal, No. 13

Gleason Works, 1000 University Ave., Rochester, N. Y. [Vol.73,p.903.] 395.

Straight and spiral bevels with any shaft angle, hypoids, helicals, angular helicals, internal, herringbone, and spur gears can all be tested on the No. 13 universal testing machine. The driver or pinion spindle can be run in either direction. It is mounted on a head which can be adjusted vertically.

The gear or drive head has three adjustments.



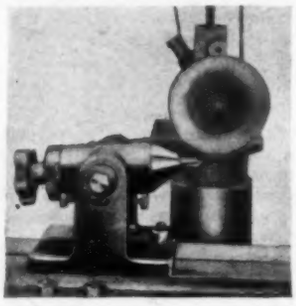
Specifications: Capacity, 13 in.; range of angles, 0 to 180 deg.; range of offset, above center, 8 in., below center, 2 in.; maximum center distance for spurs, worms, and worm-wheels, 8 in.; minimum and maximum positions of nose of drive spindle from cone center of gear to be tested, 4 and 10 in.; minimum and maximum positions of nose of brake spindle from cone center of gear to be tested —5 and +10 in., and net weight, 3,500 lb.

Grinding Attachments for Gear Chamfering Machine

City Machine & Tool Works, East Third at June Ave., Dayton, Ohio. [Vol.73,p.299.] 93.

Two grinding attachments for use with the "Peerless" gear tooth chamfering machine have been announced. They furnish a means of grinding the cutters employed on the machine. The flute grinding fixture, in which the cutter is held by a collet, is indexed by a ratchet spring arrangement.

The second fixture grinds the relief. A cam arrangement

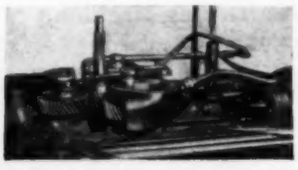


is utilized so that the cutter moves back and forth in exact relationship to the grinding wheel. The cutter is revolved by an indexing arrangement.

Burnishing Fixture, Spiral-Gear, "Bolender"

City Machine & Tool Works, East Third at June Ave., Dayton, Ohio. [Vol.73,p.610.] 234.

The fixture developed by the above concern checks the up thrust of a spiral gear while being burnished, while the downward thrust is taken care of by the locator plate. The complete burnishing cycle in-

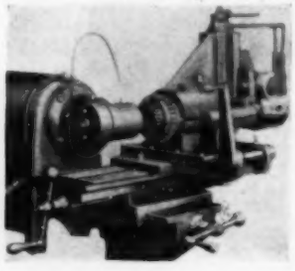


cludes a determined number of revolutions in one direction, immediately followed by an equal number of revolutions in the opposite direction.

Chamfering and Recessing Mechanism, for Peerless Tooth Chamfering Machine

City Machine & Tool Works, East Third at June Ave., Dayton, Ohio. [Vol.73,p.947.] 447.

This mechanism is for chamfering and intermittently cutting or recessing gear teeth on the Peerless tooth chamfering ma-



chine. This operation is required for the quiet second-speed transmission gears and four-speed transmissions with quiet third and fourth gears, and also the "free wheeling" type of transmission. Located at the rear is a cutting cam to furnish the in-and-out motion of the gear to and from the cutter. Both internal and external gears can be recessed.

Grinding and Lapping Machines

Grinder, Roll, Type 30

Landis Tool Co., Waynesboro, Pa. [Vol.73,p.721.] 340.

Roll bodies may be ground straight, concave, and crowned and the roll necks may be trued. Grinders are available with 36-, 48-, or 60-in. swings, and in lengths of 10 to 24 ft., in increments of 2 ft.

The front portion of the bed has a flat and an inverted V-bearing surface for supporting the headstock, foot-stock, and roll-carrying heads. The rear carries the grinding wheel carriage, on which are mounted the grinding wheelhead, crowning and concaving mechanism, traverse and reverse mecha-

nism, operator's platform, and water pump. Force-feed lubrication is provided for the wheel carriage guides and the traversing mechanism.

The 36-in. wheel is carried by a heat-treated, alloy-steel spindle driven from the right-hand end by multiple V-belts. The headstock spindle is driven through herringbone gears from an adjustable-speed motor. An equalizing drive, which drives the roll from diametrically opposite sides with equal pressure, is supplied.

Roll-carrying heads of the two-bearing type are usually furnished, although three-bearing types are supplied when the rolls are light in weight.

Grinder, Roll, 34 x 192-In.

Cincinnati Grinders Incorporated, Cincinnati, Ohio. [Vol. 73,p.869.] 364.

Designed for grinding barrels and journals of both parallel and cambered rolls, these roll grinders embody a number of features. One of these machines is of 34x192-in. capacity. All motions are motor driven, five motors being employed. The machine is equipped with a swiveling top table. Special mounting blocks fitted to the table enable rolls fitted with anti-friction bearings to be ground on the barrel without removal of the bearings. The footstock carries the radius-truing device for rounding the

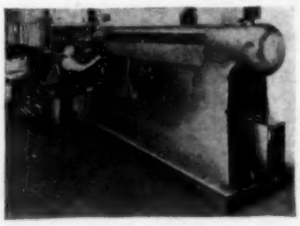
corners of the grinding wheel when grinding fillets in the roll ends. It also carries the wheel-face crowning equipment.

The camber mechanism consists of an auxiliary bracket carried on a three-point support. Swing of the grinding wheelhead and its supporting base is controlled accurately by means of the camber bar carried in the sliding carriage. The camber bar itself can be of either a permanent form or can be made from a parallel deep-section bar sprung and clamped to meet the requirements of the roll being ground.

Grinder, Internal, Model M H

Hutto Engineering Co., Inc., 515 Lycaste Ave., Detroit, Mich. [Vol.73,p.177.] 47.

A bore 50 in. in diameter by 6 ft. long and containing numerous parts can be held to a tolerance of 0.0005 in., and the job can be performed in two hours, removing 0.020 in. in stock on this machine, which requires a floor space of 8 ft. by 25 ft. 9 in., and 25 hp. for the two variable-speed hydraulic pumps. The pumps are inclosed in the base, being mounted in tandem and driven through a chain from a 25-hp. motor. The forward pump supplies power through a two-way valve into a hydraulic mo-



tor, which gives the spindle revolution. The rear pump operates through a four-way valve and supplies pressure to a hydraulic motor connected to the feed screw. These hydraulic pumps will create pressures above 1,000 lb. per sq.in. The working table of the machine is very large to accommodate cylinders of great diameters. Kerosene storage of 80 gal. is provided by tanks in the table of the machine.

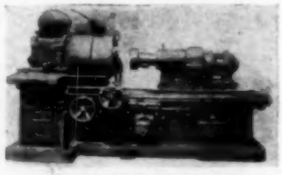
Specifications: Capacity of machine, 6- to 60-in. diameters;

maximum stroke, 84 in.; spindle speeds, 3 to 96 r.p.m.; reciprocating speeds, 0 to 55 ft. per min.; size of table, 96x156 in.; table working surface, 80x 120 in.; distance from floor to center line of spindle, 60 in., and distance from table to center line of spindle, 40 in.

Grinder, Internal, Heavy-Duty, No. 77

Heald Machine Co., Worcester, Mass. [Vol.73,p.563.] 246.

The No. 77 machine is designed for the rapid removal of large amounts of stock on big work with fine finish and close accuracy. It will grind straight or taper bores and face grind without changing the set-up. Three motors are provided, one for the wheelhead, one for rotating the work, and one for driving the hydraulic



pump. A 7-in. wide endless belt is used for the wheelhead.

Hydraulic table operation gives speeds varying from 0 to 25 ft. per minute. Automatic reversal of the table is controlled by three adjustable dogs. Hand longitudinal feed is also provided.

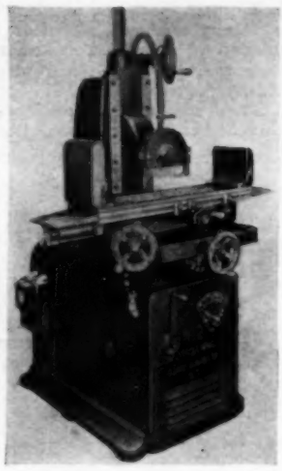
The wheelhead and driving motor form a single unit. The workhead is mounted on a cross-slide. Instead of the wheel being fed into the work, the work is fed to the wheel. Any amount of feed from 0.00014 in. to 0.0011 in. per stroke is obtained by an adjustable pawl.

Specifications: Largest bore, 21 in.; smallest bore, 3 in.; greatest length of bore, 15 in.; swing over table, 35 in.; hole through spindle, 1⅞ in.; workhead speeds, 35 to 140 r.p.m.; total transverse movement of workhead, 14 in.; diameter of work spindle flange, 12 in.; maximum travel of table, 36 in.; floor space, 123x78 in.; net weight, 18,000 lb.; total power, 31 hp.

Grinder, Surface, No. 2

Gallmeyer & Livingston Co., Grand Rapids, Mich. [Vol. 73, p.221.] 87.

Hydraulic drive to the table is featured in the No. 2 surface grinder. Table working surface is 6x18 in. An infinite variation in speeds from 0 to 60 ft. or more per min. can be obtained from the hydraulic system. The cross feed can be varied from 0.01 to 0.125 in., and this can be made to operate



at either end of the stroke or at both ends of the stroke. The cross feed is also operated hydraulically.

The motor is housed in the base, together with the hydraulic pump, the control valve, and the oil tank for the hydraulic operation. As shown, the machine is arranged for wet grinding. The machine can also be furnished for dry grinding, and with a dust-collecting system as an extra.

Standard size of the wheel carried is 8 in. in diameter by ½ in. face, but other sizes can be used. Capacity is for work 9½ in. thick. A cross feed of 6½ in. is provided, so that a wheel ½ in. wide will clear the working surface of the table on both sides.

Grinder, Surface, Hydraulic, Type G

Diamond Machine Co., 9 Codding St., Providence, R. I. [Vol.73,p.453.] 196.

Capacity is 7½ in. wide by 22 in. long by 9 in. high beneath a 10-in. diameter wheel. Two means are provided for movement of the wheelhead; the coarse feed elevating handwheel on the front of the bed, and the elevating, micrometer-feed handwheel, graduated in ten-thousandths.

Spindle drive is effected by a 1½ - hp. 1,800 - r.p.m. motor through a V-belt and sheaves. The saddle carries the table and the hydraulic cylinder. Power cross feed at each end of the table travel is operated by a

hydraulic piston. Maximum cross-feed travel by power or by hand is 8½ in. The table platen is 22 in. long by 7½ in., and is provided with three T-slots.

High table speeds are afforded by the hydraulic drive mechanism, which operates at a maximum of 50 ft. per min. An 8-in. x 22-in. x 3¾-in. magnetic chuck can be supplied as extra equipment.

Specifications: Feeds, cross, automatic, up to 0.125 in. per stroke; handwheel feed, 0.400 in. per revolution; vertical coarse feed, one revolution, 0.125 in.; micrometer feed, handwheel, graduated to 0.0001 in.; motors, spindle, 1½ hp., oil pump and coolant pump, 1 hp.; floor space, 88¾ in.; depth, 43½ in.; height, floor to table, 36¼ in.; shipping weight, with motors, 2,600 lb.

Grinder, Car-Wheel, 44-In.

Norton Co., Worcester, Mass. [Vol.73,p.723.] 327.

The machine is equipped to grind car wheels up to 44 in. in diameter and engine truck wheels up to 36 in. in diameter. The minimum diameter of wheels that can be ground is 20 in. Only standard 4-ft., 8½-in. wheel mountings are ac-

commodated. Optional arrangement of the work supports is available. The supports are adjustable for height by means of convenient handwheels. Work supports for ball- or roller-bearing axles can be supplied.

Two complete, motor-driven grinding wheel units are employed. Each slide is reciprocated independently by power through ⅜ to 1½ in. to give even wheel wear. Wheels are 24x2¾ x5-in. hole, although guards to take 4-in. thick wheels can be supplied. All five motors on the machine are controlled from push-button stations.

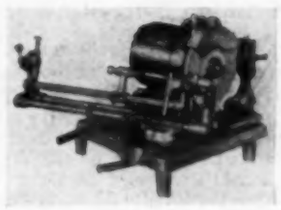
Floor space required, 13 ft. 8 in. x 11 ft. 5 in.; weight, with motors, 35,000 lb.

Grinder, Tap, Eccentric, No. 12

Wells Manufacturing Co., P.O. Box 613, Greenfield, Moss. [Vol.73,p.183.] 35.

Grinding of taps eccentrically can be done correctly by means of the No. 12 tap grinder. This method gives each tooth a new edge with a correct curve on all lands and eliminates the possibility of any one land taking all the cutting strain.

The grinder is driven by a ⅛-hp. motor operating on 110

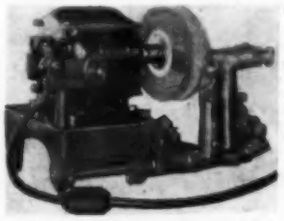


or 220 volts. Over-all size of the device is 18x18x9 in., and weight is 85 lb.

Grinder, Tap, No. 10

Wells Manufacturing Co., P.O. Box 613, Greenfield, Mass. [Vol.73,p.187.] 34.

Sharpening taps ¾ in. and smaller can be done on No. 10 tap grinder. The tap is mounted in a draw-in chuck held in a quill. After the tap has been lightly gripped in the chuck, the quill is slid into the "lining-up" holder shown at the left and fixed in the correct position. The tap and quill are then in-



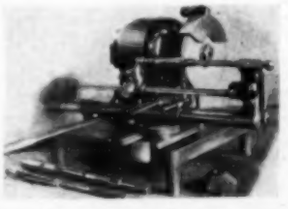
serted in the grinding fixture at the right. This fixture has a cam that produces the correct relief. The tap may also be held in a fixture for correctly thinning the point on an emery wheel.

A ⅛-hp. motor operating on 110 or 220 volts furnishes power. The size of the unit is 16x12x11 in., and the weight is 50 lb.

Grinder, Reamer, No. 90

Wells Manufacturing Co., P.O. Box 613, Greenfield, Mass. [Vol.73,p.302.] 119.

A bench-type machine for sharpening straight or taper reamers up to 2½ in. in diameter, and with flutes up to 4 in. long, and over-all lengths up to 12½ in., has been developed. The machine will sharpen valve-seat reamers of any standard



size or angle. A diamond dresser is furnished.

The machine is supplied with a ⅛-hp. motor. Bench space required, 14x21 in.; weight, 65 lb.

Grinder, Thread

Wells Manufacturing Co., P.O. Box 613, Greenfield, Mass. [Vol.73,p.302.] 118.

Grinding taps, thread gages, and other screw threads to close limits can be done on the Wells thread grinder. Straight or taper work up to 2½ in. in diameter and with a threaded portion 3½ in. long can be taken.

The grinding wheel spindle may be inclined. Continuous

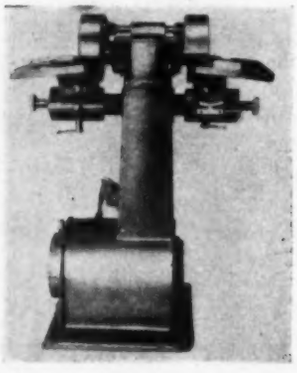
cutting is obtained on both forward and reverse passes of the work. The work spindle is driven through change gears.

Weight, 1,400 lb.; floor space, 26x65 in.

Grinder, Tungsten-Carbide-Tool

Oliver Instrument Co., Adrian, Mich. [Vol.73,p.528.] 206.

This duplex grinder mounts two 9-in. cup wheels with 2 in. face. Drive to the spindle is from a 1-hp. motor. The double unit permits complete grinding of a tool on one machine.



The protractor is graduated up to 50 deg. either side of center. Both grinding wheels can be run in either direction for grinding right- or left-hand tools. A diamond wheel dresser assures the wheel face being parallel with the tool guide. Tilting of the tables to 25 deg. is arranged for.

Lapping Machine, Tungsten-Carbide, Model H-3

Modern Diamond Tool Co., 1050 Mt. Elliott St., Detroit, Mich. [Vol.73,p.534.] 131.

The weight of the machine is about 350 lb., and it is driven by a ¼-hp. electric motor, the lapping wheel and spindle run-

ning at one-half the motor speed. The spindle is furnished with either a plain or copper-studded lapping wheel for diamond lapping of tungsten carbide.

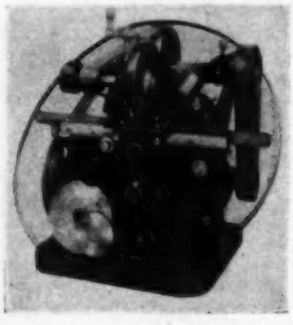
The machine has an adjustable horizontal slide, a vertical slide, and a movable platen or work holder. An angle gage is made to slide across the top of the platen.

Grinder, Saw, No. 00

J. E. Porter Machine Co., 1872 Jefferson St., Muskegon, Mich. [Vol.73,p.871.] 385.

Hacksaw blades, bandsaws, and circular saws can all be sharpened on the No. 00 saw grinder.

Circular slitting saws from 2½ to 5 in. in diameter with teeth from 4 per in. to the finest, with an arbor hole ¾ in.



and larger, can be ground, and smaller than ¾ in. as special. The machine will also grind hacksaw blades in any width up to 1½ in., 4 teeth per in.

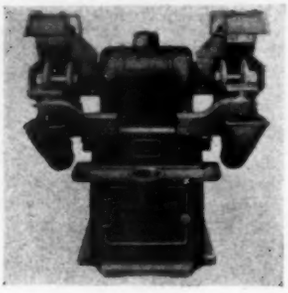
Another model is available to sharpen both hacksaws and bandsaws, but not circular saws, whereas the third is for circular saws only. Bench space required is 15 by 21 in. Shipping weight, 190 lb.

Grinders, Floor-Stand, Heavy-Duty, Type W

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.73,p.68.] 13.

Two sizes, 5- and 7½-hp., of the Type "W" heavy-duty grinder are intended for production service on heavy tool grinding. Each is fitted with a totally inclosed, 40 deg. C. motor, fitted with a motor air cleaner and equipped with push-button control.

The spindle is made of chrome-nickel steel, ground and balanced. Wheel guards are

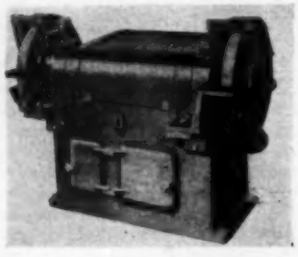


made of boiler plate steel and are adjustable. Adjustable and demountable toolrests are standard.

Grinders, Floor-Stand, High-Speed, Heavy-Duty, Series "T"

King Bros. Engineering Works, 1300 N. Kostner Ave., Chicago, Ill. [Vol.73,p.184.] 45.

This line consists of a Type "RT" for 18x2-in. wheels; Type "ST" for 24x3-in. wheels; and Type "TT" for 30x4-in. wheels. The motor is mounted at the rear instead of below. The wheel shaft is split and connected with a rigid, bolted coupling, which can be removed for quick and simple replacement of the V-belts. The quick speed change sheave arrangement has only one nut to remove. A safety device to prevent improper wheel speeds con-

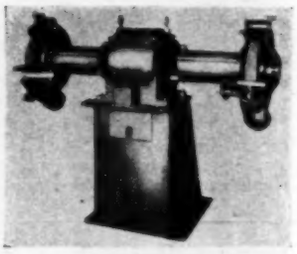


sists of a cam and lever movement, actuated from the spark guard to the control arms located under the motor base.

Grinder, Floor-Stand, Extended-Arm, "One Profit"

Production Equipment Co., Cleveland, Ohio. [Vol.73,p. 682.] 218.

A wide spread between the two wheels on the "One Profit" pedestal grinder permits the grinding of awkward and clumsy shapes. The motor is completely inclosed and requires no ventilation. Four heavy-duty ball bearings, two in each extended arm, provide rigidity to



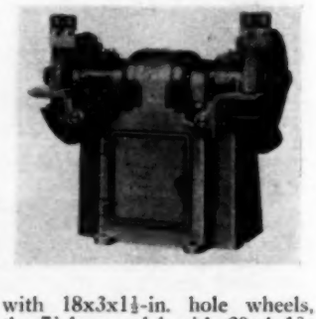
the extra-heavy, nickel-steel spindles.

Grinders, Floor-Stand, 5-, 7½ and 10-Hp.

The Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.73,p. 801.] 321.

Guards on the three heavy-duty, floor-stand grinders are supported by two heavy steel brackets and are adjustable. Heavy steel tool-grinding rests are provided, and are adjustable and removable.

The 5-hp. machine is equipped

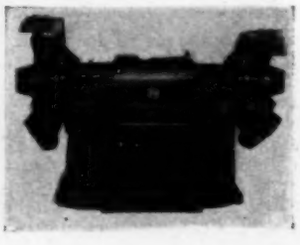


with 18x3x1½-in. hole wheels, the 7½-hp. model with 20x4x1¾-in. wheels and the 10-hp. model with 24x4x2½-in. wheels. No load speeds of the three models are 1,140, 1,140, and 900 r.p.m., and the distances between the wheel centers are 43, 44, and 44 in. The net weights range from 1,650 to 2,000 lb.

Grinder, Floor-Stand, High-Speed, "Select-O-Speed"

Hammond Machinery Builders, Inc., Kalamazoo, Mich. [Vol.73,p.835.] 372.

Peripheral speed of 9,000 surface ft. per min. is given to the wheels of the "Select-O-Speed" grinder to give maximum grinding efficiency with Bakelite and rubber-bonded wheels. The machine can also be arranged for use with vitrified grinding wheels. Wheels of 24, 20, 18, and 16 in. in diameter can be used effectively, and a 7½-, 10-,



or 15-hp. motor can be supplied.

Power is transmitted from the motor mounted at the rear to an intermediate drive shaft by means of V-belts. Speeds are changed by means of quick-change pulleys on the motor. Wheel guards are adjustable. Shatterless glass eye shields are fitted.

Grinder, Swing-Frame, Multi-Speed

Black & Decker Manufacturing Co., Towson, Md. [Vol. 73,p.872.] 379.

Three speed changes can be had in this swing-frame grinder. Wheel sizes are 12, 16, 18, 20, and 24 in., and the wheel speeds range from 6,000 to 9,000 s.f.p.m.

The adjustable steel wheel

guard is arranged to make the various speed changes. Provided with the guard is an arrangement that prevents the operator from failing to make the speed changes as the wheels wear. Also, there is supplied a visual device which shows whether or not proper guard and speed changes have been made. A heavy-duty, ball-bearing motor is supplied with the grinder.

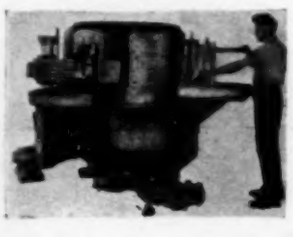
Grinder, Abrasive-Disk, with Power-Oscillated Tables, No. 49-53

Charles H. Besley & Co., 118-124 No. Clinton St., Chicago, Ill. [Vol.73,p.260.] 99.

Either wet or dry grinding may be employed on the No. 49-53 grinder with power-oscillated tables. The machine is of the motor-driven type, requiring a 40-hp., 220- or 440-volt, 3-phase, 60-cycle, 450-r.p.m., a.c. motor, with automatic starter and push-button control.

Both geared, lever-feed tables are mounted on vertical shafts and are operated by means of motor-driven worm-gear reduction drives connected to the vertical shafts by steel connecting rods. The oscillating fixture is driven by a 1½-hp. motor. The geared lever-feed tables have a special spring feed and lock-out arrangement, so that the operator can take care of both tables.

Each station is provided with



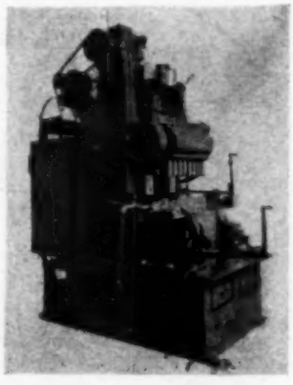
an adjustable loading platen. The steel disk wheel is drilled and tapped for steel-back abrasive disks up to 2 in. in thickness. By using a special fixture, dimension work can be ground, and also work with faces at right angles.

Lapping Machine, Cylinder-Block, Hydraulic, No. 11

Moline Tool Co., Moline, Ill. [Vol.73,p.29.] 1.

One of the features of this machine is the special type of main drive used for the spindles. After the reciprocating rail has completed a predetermined number of strokes, and at the instant it reaches the top of the withdrawal stroke out of the cylinder, a switch is tripped automatically. This reverses the main driving motor, causing it to brake the spindles. Speed change gears are inclosed in the gearcase at the left end of the rail.

A push-button control for the main driving motor is located on the front right-hand corner



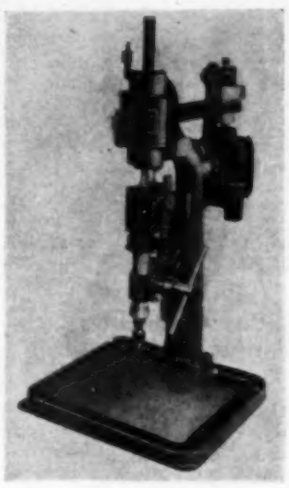
of the jig. The Oilgear pump for reciprocating the rail is located on top of the column and is driven by a separate motor. Reciprocation of the hones stops automatically when the rail reaches the top of the withdrawal stroke. To facilitate moving the cylinder block in and out of the holding fixture, rollers are provided.

Lapping Machine

Onsrud Machine Works, Inc., 3910 Palmer St., Chicago, Ill. [Vol.73,p.184.] 37.

This lapping machine is similar in design to a standard bench drill, but is equipped with a device to adapt the unit to lapping work. The spindle has three speeds, namely, 1,000, 2,200, and 5,000 r.p.m. A system of gearing imparts to the spindle a positive oscillating movement. The length of stroke is ¼ in., but a longer or shorter stroke can be had.

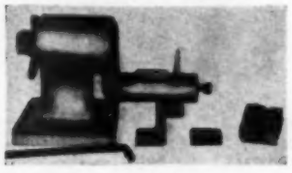
Height is 38 in.; bench space, 15x20 in., and net weight, 220 lb. A ½-hp. motor is required.



Dresser, Radius

Universal Tool & Machine Co., 14 St. Louis Ave., Dayton, Ohio. [Vol.73,p.339.] 142

A device for dressing surface grinding wheels, either convex or concave, for grinding sectional dies, forming dies, punches, models, and tools to various radii has been produced. Accurate gage-blocks are used for setting the diamond of this tool in the proper position for dressing any radius desired. The diamond is set quickly for



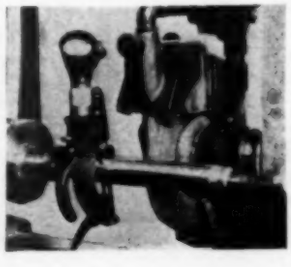
any convex radius up to 0.750 in.

This dresser pivots in a horizontal position, thus the grinding wheel can be fed down to the diamond the exact amount of the radius to be dressed. The Model "O" radius dresser will clear a 7-in. grinding wheel.

Gage, Grinding, Portable, Krupp Mikrotast

Coats Machine Tool Co., Inc., 110-112 W. 40th St., New York, N. Y. [Vol.73,p.527.] 220.

Gaging cylindrical work can be carried out without stopping the grinder. Contact points are of Krupp "Widia" metal to offset the abrasive action of the rotating work. Thumb-pressure



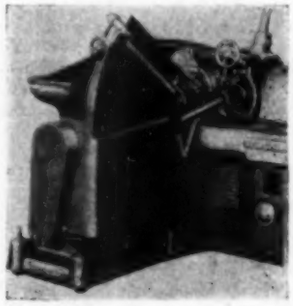
on the lever will raise the V-shaped upper jaw, which is then snapped on the work and held there by means of this jaw and the adjustable support which rests against the bed of the machine. The fan-shaped, knife-edge-operated, Mikrostat indicator is graduated in 50 divisions of either 0.0001 in., 0.0002 in., 0.0005 in., or 0.0001 in. The gage is made in five sizes, from 1¼ to 8 in.

Hoppers, Thru-Feed and In-Feed, Improved

Cincinnati Grinders Incorporated, Cincinnati, Ohio. [Vol. 73,p.571.] 242.

One of the major improvements is the low work basin. These improved hoppers are individually motor driven.

The "Feed-Matic" in-feed hopper feeds headed or shouldered work up to 8 in. under the head, head diameters up to 2 in., and ground diameters up to 1½ in. This hopper is powered by an inclosed, ½-hp. motor with push-button control. The ejector rod on the automatic in-



feed attachment controls the timing of the hopper.

The "Feed-Matic" thru-feed hopper is arranged for feeding straight cylindrical work ¼ to 1½ in. in diameter up to 8 in. long, the minimum length exceeding the diameter.

Grinding Attachment, Drill

Wappat, Inc., Electric Tool Div. of Simonds Saw & Steel Co., 7522-26 Meade St., Pittsburgh, Pa. [Vol.73,p.649.] 275.

For use with a 6-in. bench grinder, this device is particularly suitable for small shops. The device will grind all 2-lip drills from the smallest up to ½ in. in diameter. Adjustments for varying the diameter and the clearance can be made easily and accurately.

Lathes

Lathe, Engine, 60-In., Face-Plate-Drive, Heavy-Duty

Wickes Brothers, Saginaw, Mich. [Vol.73,p.377.] 155.

This lathe has been completely redesigned and is now made with unusually large members, equipped throughout with ball or roller bearings. Exceptions are the main spindle bearings, which are bronze boxes. All gears are of alloy steel, heat-treated and hardened, and sliding gears are mounted on splined shafts.

The geared headstock provides 16 spindle speeds and a range

of face-plate drive speeds from 2 to 50 r.p.m. Direct spindle speeds from 8 to 200 r.p.m. are also obtainable. Electric rapid longitudinal traverse for the carriage, as well as power rapid cross traverse, can be provided.

Specifications: swing over bed, 62 in.; swing over slide on carriage and compound rest, 50 in.; length of bed (standard), 20 ft.; between centers, 8 ft.; between centers (tailstock overhung), 9 ft. 1 in.; Morse taper centers, No. 7; hole in spindle, 2¾ in.; number of feed changes, 40; tool shank, 2½ in.; net weight, 48,000 lb.; hp. required, 40, and floor space, 7 ft. 1 in. by 22 ft. 0 in.

Lathe, Geared-Head, 24-In.

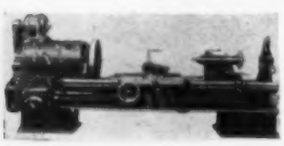
Axelson Machine Co., P. O. Box 337, Los Angeles, Calif. [Vol.73,p.411.] 164.

This lathe was developed primarily for shops handling large cuts, such as on oil-well drilling bits and reamers. Three levers on the headstock afford quick selection of spindle speeds.

The lathe is driven by a motor mounted on top of the headstock, operating through a silent chain. A pulley for belt drive may be furnished. An improved, quick-change gearbox provides 45 instantaneous changes. Twelve spindle speeds are arranged in geometric progression.

The taper attachment is operable the full length of the bed. The 8¾-in. steadyrest is standard.

Specifications: swing over bed, 27½ in.; swing over carriage, 18½ in.; between centers, tailstock flush, 4 ft. 5 in.; hole through spindle, 2¼ in.; Morse taper centers, No. 5; range of thread cutting, from 1 to 30, including 11½; tool size, 1 in. x 2 in.; height over-all, 56 in., and length, 11 ft. 10 in., and weight, 10,000 lb.

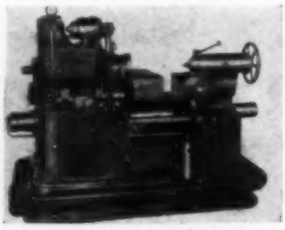


Lathe, Automatic, Hydraulic, 17-In.

John S. Barnes Corporation, Rockford, Ill. [Vol.73,p.720.] 328.

Swing of 17 in. over the rear cross-slide, instead of 16 in., as quoted in the previous description on page 743, Vol. 72, is now featured in the No. 17 automatic lathe with hydraulic feed.

Individual pumps containing very few parts feed the front and rear carriages. Rapid traverse is taken care of by an independent gear pump. A 3-way valve controls the machine, and by setting dogs, the front and



rear carriages can be started and stopped simultaneously, or arranged so that one carriage starts or stops ahead of the other. The spindle runs clockwise, contrary to ordinary lathe practice.

Specifications: swing over front cross-slide, 13 in., over rear cross-slide, 18 in., over carriage bar, 26 in.; distance from tailstock center to face of spindle nose, 20 in.; speed range, 8 speeds, from 30 to 375 r.p.m.; feed range, 0.001 to 0.100 in.; hole through spindle, 1½ in.; travel of front carriage, 8 in.; travel of rear carriage, 6 in.; motor recommended, 7½ to 20 hp.; floor space required, 78x55 in.; and weight, 6,500 lb.

Lathe, 3,000 R.P.M., Model "AA"

The Monarch Machine Tool Co., Sidney, Ohio. [Vol.73,p. 722.] 219.

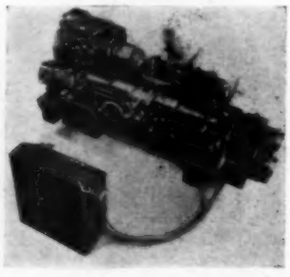
Spindle speeds up to 3,000 r.p.m. and higher can be obtained on the Model "AA" 16-in.x6-ft. high-speed lathe. The features of this unit are: Timken bearings, automatic feed length stops, any type of tool equipment desired, including an automatic facing attachment and multiple toolrests. The lathe is designed for manufacturing purposes and is intended to use tungsten-carbide tools.

Either a d.c. variable-speed motor or an a.c. multi-speed motor can be mounted in the large cabinet base.

Lathes, Form-Turning, "Monarch-Keller"

Monarch Machine Tool Co., Sidney, Ohio. [Vol.73,p.873.]

For turning or facing special shapes in any form for which a thin master templet can be made, the "Monarch-Keller" form-turning lathes have been developed. The lathes are made possible by the application of the electrical controls manufactured by the Keller Mechanical Engineering Corporation. A control unit consists of three main parts: A standard Keller tracer, two Keller magnet boxes, and a control cabinet.



A thin metal templet is mounted on a bracket at the back of the lathe, parallel to either the longitudinal or cross feed—depending upon the position of work in the lathe, whether between centers or on the faceplate.

Work can be automatically formed on the lathe to the full swing capacity of the lathe, and to the full length between centers. The Keller controls are extremely accurate and will duplicate the master templet to limits as close as 0.001 in.

The Keller automatic control is built in on all types of Monarch helical-geared, Timkenized lathes, on all sizes from 14 to 36-in. swing.

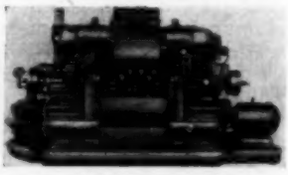
Lathe, Crankpin-Turning and Cheek-Facing, Double-Cut

Crankshaft Machine Co., 320 North Jackson St., Jackson, Mich. [Vol.73,p.905.] 354.

Automatic operation is featured in the double-cut cheek-facing and pin-turning lathe. The machine can also be operated by hand when desired. Two push-button stations and three levers furnish the controls.

A 25-hp. motor turns the work spindles and other rotating parts. Crankshafts are held in air-operated chucks connected to a 12-in. air cylinder, and the steadyrests are also air operated. Double-end drive is employed.

By making the two eccentric, or master crankshafts, in three sections, it is possible to remove all the special parts required for machining different crankshafts from the machine without dis-



turbing the standard parts or throwing the machine out of time.

Tools on the upper arms rough the cheeks and rough turn the pins and pin walls, while those mounted on the lower arms finish turn the cheeks and pin walls.

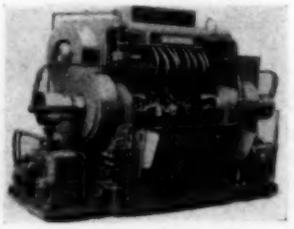
The machine weighs 44,000 lb., and is built in lengths for 4-6, and 8-cylinder crankshafts.

Lathe, Crankshaft, Pin-Finish, Automatic, No. 5 ACP

R. K. LeBlond Machine Tool Co., Cincinnati, Ohio. [Vol.73, p.681.] 306.

To eliminate the rough-grinding operation on pin bearings of automobile crankshafts, a Type 5 ACP machine has been developed for finish-turning the diameter and facing the side walls simultaneously. Because of the orbital motion required, two like master cranks are geared with the spindle. These cranks are connected with a carrier mounting the tool block on the front face. The upper crank is carried in a cradle that pivots at the intermediate driving gear center, and the tool carrier members are connected with the upper crank by means of short connecting rods. The cradle is actuated by a hydraulic cylinder through a rack, gear, and toggle motion.

The crank is held and driven at the flange and stub ends. It is held in a half bush in the main body of the chuck by two jaws, each of which is operated by a plunger.



Lathe, Screw-Cutting, Precision, Type PF-2A, Société Genevoise

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol. 73,p.1020.] 453.

The smallest screw-cutting lathe manufactured by the Société Genevoise d'Instruments de Physique, Geneva, Switzerland, and marketed in the United States by the above concern, has been redesigned. It now has a bored spindle, permitting the use of spring collets and the machining of long thin pieces, as well as working the larger

pieces on a revolving center. It is also provided with a slotted faceplate permitting internal threading.

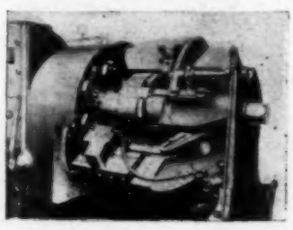
By means of a set of change gear wheels it is possible to obtain 36 pitches in inch units between 4.5 and 100 threads per inch as well as 37 metric pitches from 0.1 mm. to 5.0 mm. Accuracy of the threads obtained is guaranteed to 0.0001 in. for the range of the machine, that is 8 in. Maximum distance between centers is 8⅜ in. and external threads up to 2 in. can be cut. The maximum diameter of a workpiece over the ways is 6⅞ in., and over the carriage, 4¾ in.

Spring collets of an external diameter of $\frac{5}{16}$ in. are supplied in sizes varying from 0.02 in. instrument from 0.02 in. to 0.5 in., or special collets can be supplied. Over-all length is 31½ in., width, 15½ in., and height 13$\frac{29}{32}$ in., height of spindle over the bottom of the bed being 9⅛ in.

Lathe, Six-Spindle, Horizontal, 7x8-In.

The Baird Machine Co., Bridgeport, Conn. [Vol.73,p. 567.] 247.

Work up to 7 in. in diameter by 8 in. long can be turned on this six-spindle lathe. The work end is illustrated. The lathe is designed to handle work turned on centers, the center bar carrying a turret containing the tail centers, this bar and turret indexing with the spindle turret. Ease and speed in unloading and reloading work are obtained by providing a treadle for withdrawing the tail centers. When



the machine is arranged for "double indexing," two pieces of work are unloaded and loaded and the turrets index two stations at each cycle.

The machine stops automatically when the cycle of operation is completed, though it is reset automatically when reloaded. Ordinarily, four longitudinal slides are provided.

When the machine is set up as "single indexing," five work stations are available for each piece, four stations being provided with the regular longitudinal tool slides and the fifth station with some other tool arrangement. Chucks or other holding fixtures can be used on the spindles.

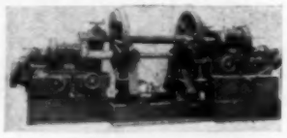
Floor space, 54x92 in.; weight, 12,000 lb.

Lathe, Wheel, Turning and Quartering, Crankpin, 90-In.

The Niles Tool Works Co., Hamilton, Ohio. [Vol.73,p.526.] 230.

Both heads will turn crankpins or quarter simultaneously, or either head will turn crankpins while the other head is quartering. A combination helical and V-belt drive and a worm and gear feed afford smooth finish. When the wheel set is in position, the right crankpin or crankpin hole on right-lead engines (when facing the machine), is on the front center and the left crankpin is on the bottom quarter.

The right-hand head is mov-



able out and in for stroke position and the left-hand head is movable up and down for stroke position. Each unit consists of a substantial sub-base, box-turning head, drive, and feed mechanism. Each head is provided with hand and power traverse in both directions.

Specifications: capacity, 90 in.; maximum distance between centers, 6 ft. 2½ in.; size crankpin turned, 12x25 in.; boring bar travel, 13½ in.; range of stroke setting, 12 to 18 in.; diameter boring bars furnished, 3½ and 4½ in.; feeds, $\frac{1}{32}$ and $\frac{1}{16}$ in.; recommended speeds, 5 to 35 r.p.m.; and length over-all, 18 ft.

Screw Machine, Automatic, for Motor Drive, No. 00G

Brown & Sharpe, Providence, R. I. [Vol.73,p.180.] 46.

The range of spindle speeds available on No. 00G automatic screw machine of the high-speed type and for motor drive only

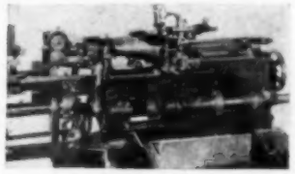
has been increased. Thirty spindle speed changes, ranging from 243 to 5,000 r.p.m., are now available. This range adapts the machine to production from steel as well as brass, aluminum, and other free-cutting metals. Speed changes are accomplished by means of ten change gears and three spindle driving pulleys in ratios of 1 to 3 and 1 to 5. The machine is adaptable to use with the automatic rod magazine and the vertical slide.

Roller Feed and Timing Mechanism for Automatic Screw Machines

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol. 73,p.905.] 382.

Where the pieces are of considerable length, this equipment saves time, since one operation of the roller feed is sufficient to feed the piece the required distance. This eliminates multiple feedings with feeding fingers. The end of each new bar is positioned to permit trimming to remove waste, leaving only a suitable amount for chucking at the last end.

To determine the position for



trimming, a swing stop with control mechanism is used. This stop functions only once to each new bar.

Center, Live, "Detroit"

H. & L. Sales Division of John E. Livingstone & Co., 2-246 General Motors Bldg., Detroit, Mich. [Vol.73,p.801.] 339.

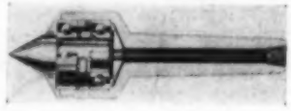
A replaceable cone tip made from 0.008 in. thick phosphor-bronze forms the live member of the "Detroit" live center. This renewable cone tip revolves with the work and forms a bearing against the hardened steel dead center.

This center prevents chatter when using tungsten-carbide tools. It need not be backed off as with dead centers, and no "feel" is necessary. Such centers are stocked with Nos. 2, 3, 4, and 5 Morse tapers. Brown & Sharpe, Reed, Standard, Jarno, and other special tapers can also be furnished.

Center, Live, Ball-Bearing

Sturdimatic Tool Co., 12121 Cardoni Ave., Detroit, Mich. [Vol.73,p.1026.] 498.

Compensating means for the extra thrust imposed by work heating up during machining are embodied in this ball-bearing live center. This is effected by the use of two steel cushioning rings between the two ball bear-



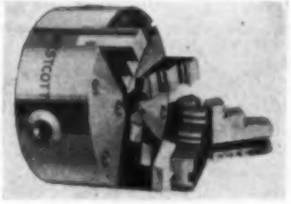
ings. The housing has a removable threaded plug at the tapered end for the attachment of an Alemite fitting. Seven sizes are available, with Morse tapers varying from 2 to 7.

Chucks, Scroll, Bevel-Geared, Universal

Westcott Chuck Co., Oneida, N. Y. [Vol.73,p.646.] 277.

One-piece bodies are employed for these bevel-geared scroll universal chucks. Steel forgings are used exclusively in the smaller sizes, 3, 4, 5 and 6 in., and larger sizes are available with semi-steel or electric steel bodies. Furthermore, special steels are used in the jaws, scrolls, and pinions.

These chucks are made in the



following sizes: 3, 4, 5, 6, 7½, 9, 10½, 12, 15, 18, 21, and 24 in. The last three sizes are extra-heavy in design. These chucks are furnished with two sets of jaws; one set for either outside or inside chucking at the customer's option, or two-piece reversible jaws.

Chuck Jaws, Hydraulically Equalized

Gisholt Machine Co., Madison, Wis. [Vol.73,p.907.] 409.

Hydraulically equalized jaws applicable to two-, three- and four-jaw chucks of most any type or make are made to spe-

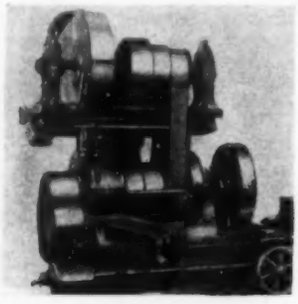
cial order. They are particularly suitable for parts requiring powerful chucking action, such as thin-walled parts that can easily be distorted, and also rough castings or forgings.

Each of the jaws contains four pistons providing chucking points. These pistons are backed up by a common body of liquid, which transmits pressure from one piston to the others to equalize the casting.

Drive, Lathe, Universal

Hertzler & Zook Co., Belleville, Pa. [Vol.73,p.184.] 50.

Transformation of a cone-driven lathe to a motor-driven unit may be effected by this universal lathe drive. The drive is adaptable to such units as automatic screw machines, bolt threaders, plain and universal



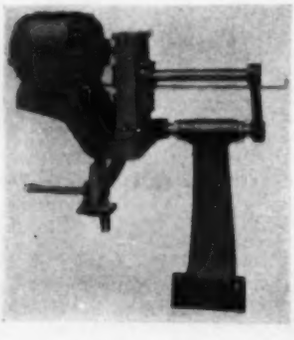
milling machines, boring mills, and turret, engine, and axle lathes. The primary speed reduction unit is effected by a silent chain drive. The rotating cam adjusting device for the secondary, or belt-driven, cones enables the operator to step the belt with ease, and also enables him to regulate the belt tension.

Drive, Lathe

Cullman Wheel Co., 1344 Altgeld St., Chicago, Ill. [Vol.73, p.910.] 428.

The drive is quickly and easily attached, only four bolt holes being needed. It is made in 1-, 2-, 3-, and 5-hp. sizes for lathes with from 14- to 36-in. swing.

The drive consists essentially

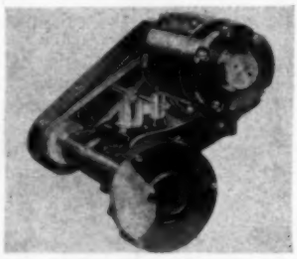


of a bracket mounted on the rear of the lathe, the shaft carrying the Cullman speed reducer with shaft extension for the cone pulley; the arm carrying the raising and lowering device for easy belt shifting; and the arm that carries the cone pulley shaft.

Grinding Attachment, No. 7

Dumore Co., Racine, Wis. [Vol.73,p.411.] 169.

A ¾-hp. universal motor is used to power this unit. Motor and quill may be turned end for end. An automatic take-up for the belt insures proper tension. A special, separable toolpost permits radial and vertical adjustment of the tool. The tool can be mounted in a lathe,



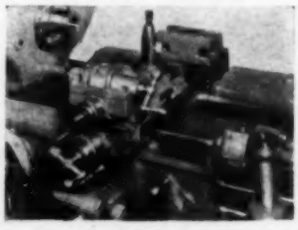
planer, shaper, milling machine, or other machine tool.

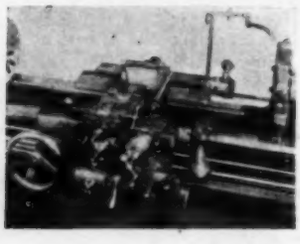
Motor speed is from 12,000 to 13,000 r.p.m. Speeds of the external grinding quill vary from 4,000 to 10,000 r.p.m. With the internal grinding quill, speeds from 10,000 to 27,000 r.p.m. are obtained. Weight, 45 lb.

Tool Block Construction Lathe, Front and Rear

Reed-Prentice Corporation, Worcester, Mass. [Vol.73,p. 418.] 189.

Improved front and rear tool block construction furnished recently has been designed to do away with interference between the handles of the compound rest and the cross feed screw. In the first figure is shown an improved type, consisting of a





compound rest in the front and a plain T-slot block with toolpost at the rear. The rear block has independent adjustment, while the lower slide is cast integral. The steel compound block has screw adjustment, permitting greater clearance and the use of a larger crank handle. Operation of the screw is from the usual position, or from the shaft mounted at right angles.

In the second figure is shown duplicate front and rear block consfruction, except that the rear block is provided with a separate screw for in and out adjustment. A quick hand feed is furnished for the screw, and a micrometer dial is employed for positioning the rear block.

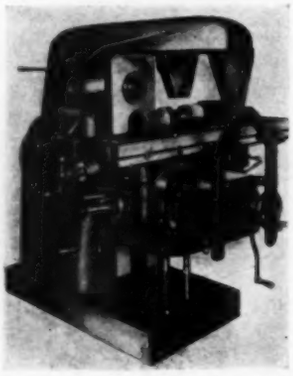
Milling Machines

Milling Machines, Plain, Universal, and Vertical, No. 2

Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol.73, p.723.] 337.

Adaptability for a large variety of work in the usual toolroom or manufacturing shop is a feature of the No. 2 plain, universal, and vertical milling machines. The 16 spindle speeds from 20 to 500 r.p.m. and the 16 table feeds from 1-20 in. (low and high series also offered) are changed by an automatic power shift mechanism controlled from either the front or rear. An automatic trip out for power quick traverse is provided on both the plain and vertical machines.

The column mechanism is



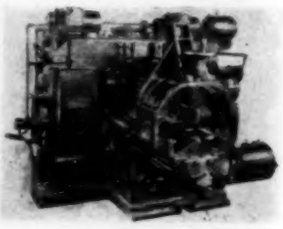
lubricated automatically by a geared pump. Another pump furnishes automatic lubrication to the knee, while a one-shot system is used for the saddle and table ways.

Specifications of plain unit: Table working surface, 49x12 in.; longitudinal range 28 in.; cross 10 in.; vertical, 10 in.; motor, 5 hp.; net weight, belt drive 5,850 lb., floor space, 98x 94 in.

Milling Machine, Automatic, Duplex, "Supermil"

De Vlieg Machine Tool Co., Jackson, Mich. [Vol.73,p.639.] 290.

This machine is an automatic, multiple-spindle miller, suitable for incorporation in conveyor-type production set-ups. Auto-



matic co-ordination of the vertical and table feeds produces a U-shaped cycle.

Both the construction and the speeds employed on this "Supermil" are suitable for the application of tungsten-carbide cutters which can be run at the rate of 300 ft. per min., and a feed of 25 in. per min. Thus, production of 25 finished 8-cylinder blocks per hour can be attained.

Pads, presenting a continuous surface in the same plane, are milled by the plain adjustable fixed cutter spindles on each side. Boring-bar-type disappearing spindles for milling bosses on opposite sides of projections are also employed, their movement being controlled by hydraulic cylinders.

The structure of this "Supermil" follows the standard De Vlieg design. For the vertical movement, there is provided a pair of motor-driven feed units. Controls for the hydraulic cylinders are operated by cams.

Milling Machines with Spindle Speeds to 1,000 R.P.M., "Milwaukee Simplex"

Kearney & Trecker Corporation, Milwaukee, Wis. [Vol. 73,p.827.] 399.

These production-type milling machines have spindle speeds as high as 1,000 r.p.m., and are basically designed for applica-

tion of tungsten-carbide cutters. Three standard speed ranges, with 12 speed changes, are optionally furnished. These ranges are 15 to 150, 30 to 300, and 100 to 1,000 r.p.m.

The heavy brace ties the spindle quill to the double overarms. This member provides a stiffening support throughout the entire cross adjustment. The spindle quill has 7 in. of longitudinal or cross adjustment. A large herringbone gear is solidly mounted on the spindle and its driving pinion is splined to insure positive drive to the spindle throughout the cross adjustment of the quill. Vertical adjustment is 9 in. for the spindle block.

An option of two ranges of 18 feeds is offered, either from ½ to 20 in. or from 1 to 40 in. per min. Power rapid traverse is 240 in. per min. Table dogs are located in a built-in compartment at the front of the table.

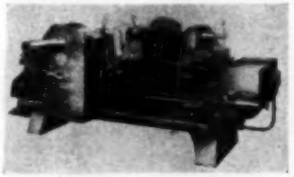
The 1,200 series machines have tables 12 in. in width, with a choice of either 18, 24, or 30 in. of table feed; and the 1,800 series machines have tables 18 in. wide with table feeds of 24 or 30 in. The machine has a multiple V-belt drive from a 5- or 7½-hp. motor.

Net weights vary from 7,300 to 8,300 lb.

Milling Machine, Cotter and Keyseat, No. 3

The Niles Tool Works Co., Division General Machinery Corporation of Delaware, Hamilton, Ohio. [Vol.73,p.179.] 54.

Finish milling of splines, slots, cotterways, and keyways in shafting, forgings, and castings may be done on the No. 3 cotter and keyseat milling machine. The two spindles move horizontally and are so arranged that they will simultaneously mill keyways or slots on a parallel axis directly op-



posite each other. Either spindle, however, can be independently operated.

Spindle heads are attached to a longitudinally moving carriage. Each is provided with independent hand in-and-out movement and power in-feed. Automatic knock-out for predetermined depth is also provided for each spindle feed.

Chucks furnished have jaws fixed for height. They are adjustable longitudinally on the bed, and can be placed on one side of the spindle heads.

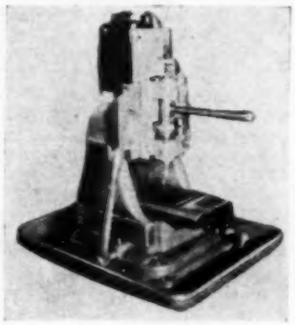
Specifications: Capacity, slots to 39 in. long, 2½ in. wide, and 16 in. deep; fixed chuck jaws take 13½ in.; driving motor, 5 hp.; dimensions, 12 ft. 6 in. length by 9 ft. 6 in. in width.

Profiling Machine, Bench, Motor-Driven

Wade Tool Co., Waltham, Mass. [Vol.73,p.797.] 352.

The machine is motor driven and employs a ball-bearing spindle. A built-in pump and oil reservoir in the base are other features.

Pieces to be milled and the guides or patterns are clamped to the lower slide, which moves



at right angles to the horizontal movement of the milling spindle, and is operated by a lever.

The cutter spindle covers an area of 1¾x4 in., and has a vertical movement of 1¾ in. Specifications: Travel of bed, 4½ in.; travel of cross-slide, 2 in.; travel of bed to spindle, 2 in.; dimensions of base, 17x21 in.; weight, 175 lb.

Transcribing Instrument for Die Sinking

Walcott Machine Co., Jackson, Mich. [Vol.73,p.566.] 235.

This apparatus is designed for use with any vertical milling machine, and converts the latter into a speedy die-sinking machine. The plaster mold is placed on the table of the milling machine at the left side of the spindle, and is then lined up as to position with the die block by means of pointers inserted in the transcribing instrument and in the machine spindle. A cutting tool is inserted in the head of the milling machine and a "follow-button" is inserted in the head of the instrument.

The accuracy of the operation is sensitively controlled by means of a visible station, which signals to the operator the direction or directions in which to feed the milling machine table.

Floor space required, 32x43 in.; net weight, 2,500 lb.

Bases, Index, Milling-Machine, Standard, Nos. 2 & 13

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.73,p.67.] 14.

The Nos. 2 and 13 standard index bases are designed for use on the B. & S. plain milling machine with automatic table movements. They consist of a heavy base bolted to the table of the machine. The swivel rotates on a heavy pivot and is

locked by a taper plunger operated by a hand lever. It can be indexed through a full circle, with working positions at 0 and 180 deg.

Standard index bases are furnished with a reversible tongue for aligning them on the table of the milling machine. A tongue slot for aligning fixtures is cut in the swivel.

Head, Milling, Internal

Earle G. Boyer Co., Second and Fisher Aves., Philadelphia, Pa. [Vol.73,p.68.] 25.

Internal milling, slotting, perforating, and splining operations can be performed with this internal milling head. This head can be furnished in sizes ranging from 6 to 24 in. in diameter by ½-in. increments with expansions ranging from 1½ in.

in the small sizes to 6 in. or larger in the larger sizes.

This internal milling head is mounted on ball and thrust bearings with nickel-chrome steel bearings. By means of a single pulley or spindle drive through an inclosed gear box, it will operate automatically and develop three distinct, separate motions; namely, milling, expanding, and traveling either in unison or individually. In addition, it will drive single or multiple cutters in two, three, four, or six directions at the same time. Principles incorporated in this head may be changed to suit the particular conditions, including several systems of mounting.

Heads, Milling, Production

Fitchburg Engineering Corporation, Fitchburg, Mass. [Vol. 73,p.683.] 262.

Special milling machines for the varied requirements of automotive and large industrial plants can be designed around these production milling heads without the use of complicated

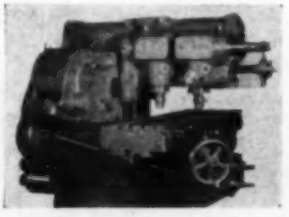
transmission systems, since each head is driven by its own 1,200- or 1,800-r.p.m. motor.

The head is made in three spindle sizes, 3, 4, and 5-in. Both right- and left-hand spindles can be had. These heads are suitable for mounting in any position, and can be arranged for permanent mounting or placed on suitably gibbed slide surfaces. Drive to the spindle is by a chilled, phosphor-bronze worm wheel and a hardened and ground worm. The spindle speed may be varied up or down by pick-off gears accessible from outside.

Milling Attachment, Vertical, Two-Spindle

The Cincinnati Milling Machine Co., Cincinnati, Ohio. [Vol.73,p.457.] 91.

A special, two-spindle vertical attachment is available for the 18-in. manufacturing milling machine built by this company. The attachment is supported by the machine overarm and bolted to the face of the column. It has one fixed spindle built integral with the casting and one adjustable spindle which may be moved crosswise. Vertical settings for the inner spindle are made with the knee, and the outer spindle has a



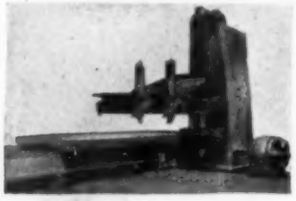
¾-in. quill end adjustment to make the final setting correspond to that of the inner spindle. The minimum distance between the spindle centerlines is 6¾ in., and maximum distance 13 in.

Planers

Planer, Openside, 96-In., "Hypro"

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.73,p.413.]

This machine has a capacity of 96 in. underneath the rail, and the left-hand head can square down a casting 125 in. wide. Operation of the planer is completely controlled by push buttons. The rail is clamped to



the uprights by means of an electric torque motor.

Lubrication is supplied to the ways, gearing, heads and other moving units by means of a pump. The heads can be operated independently of each other by rapid traverse. Slides have a down feed of 40 in. below the bottom of the rail. Special tool holders are made so as to plane in pockets any distance below the bottom of the rail within the capacity of the machine.

Approximate weight of the machine is 235,000 lb.

Planers, "Ultra-Size"

G. A. Gray Co., Cincinnati, Ohio. [Vol.73,p.867.] 389.

Refinement in design, ease, and accuracy of tool setting and operation, with sufficient power and speed to utilize tungsten-carbide cutting tools to their capacity, are the features of the "Ultra-Size" planers. The machine illustrated has a capacity of 12 ft. in width, 10 ft. in height, and 30 ft. in length, the complete machine weighing half a million pounds.

Among the design elements that differ from usual practice are: four ways, two V's and two flats; three rows of leveling screws, one in the center of the bed and accessible from the top; a steel camber beam attached to the top of the rail to insure a straight cut as the head travels across the rail; each head on the cross-rail supported by two hardened rollers mounted on ball bearings, instead of having the load come on the upper gib; over counter-balancing of all heads to take up lost motion; automatic centering of supports for all cross-rail screws and feed rods; complete interlocking control of all movements from either side of the planer and at the tool heads; the use of electric motors to lock and unlock the rail to the housing, these being automatically timed with the motors that elevate the rail. The controls enable an operator to set the tool rapidly and accurately to gage without a helper.

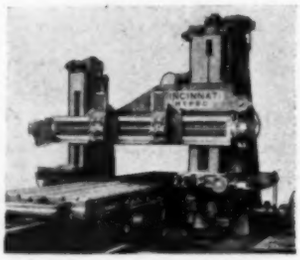
Twin helical gearing of forged steel is used, calculated to transmit 75 hp. and to give table speeds from 20 to 120 ft. per min., together with independently variable table return speeds covering the same range. This planer has a 75-hp. 200-1,200-r.p.m., G.E. reversing motor.

The side heads have the same range and capacity as the rail-heads, the slide feed being 36 in. Each side head has its own feed.

Planer, Openside, "Hypro"

Cincinnati Planer Co., Cincinnati, Ohio. [Vol.73,p.1019.] 466.

A pneumatic tool lifter has been attached to each head for use when tungsten-carbide tools are employed and is without any projecting parts or lugs that



might interfere with the work in close quarters. This tool lifter can be used simultaneously on all heads or on any head desired. Coolant is supplied to the tools, and the return is worked out in such fashion as not to interfere with the regular working surface of the table. Push-button control is now provided for all motions. On the openside the rail and knee are clamped to the column by a torque motor.

The left-hand housing is an auxiliary type to permit the use of a fourth head. The entire housing and the head can be removed in a few minutes.

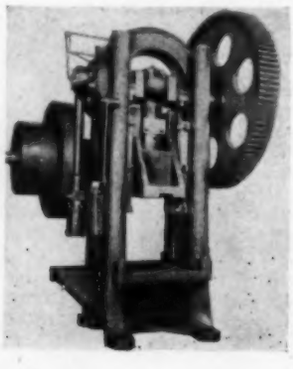
A shifting device is provided as special equipment to give short strokes varying from 1½ to 2 in., and is of advantage when machining in close quarters inside of a casting. The hand wheel at the left-hand end of the rail is part of the built-in indexing device for use in rack cutting and spacing. Small dogs are placed on the table between the regular shifter dogs for speeding up the table on gaps between parts to be planed.

Presses

Press, Straight-Sided, No. 9-16

Zeh & Hahnemann Co., 182-200 Vanderpool St., Newark, N. J. [Vol.73,p.32.] 4.

No outboard bearing is required on the No. 9-16 straight-sided power press. This unit is of built-up, tie-rod construction, and the large driving gear is located close to the frame so that the above feature can be obtained. This in turn gives free access to the jaw clutch. The press includes a side shear attachment and has central lubrication. A normal pressure



of 250 tons can be exerted. When single back gearing is employed, the weight is 37,000 lb., and the rate of operation is 30 strokes per min. The distance between the uprights is 30 in., and the standard stroke 6 in.

Press, "4 Krank"

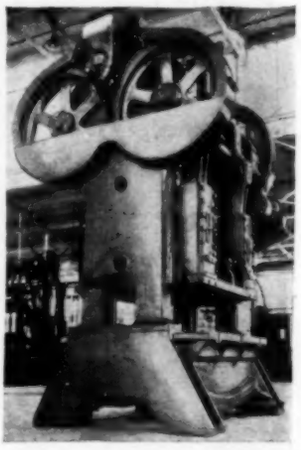
Marquette Tool & Manufacturing Co., 6500 W. 65th St., Chicago, Ill. [Vol.73,p.451.] 200.

Because the load pressure is brought on the slide through four separate cranks paired off against each other, any cocking tendency of the platen is prevented and no undue strain is put upon the guides or the leader pins of the dies. This construction makes possible blanking or piercing operations of large dimensions.

A motor upon a bracket drives the flywheel direct through a pinion. At the far end of the jackshaft is a steel herringbone pinion that engages a large steel gear on one crankshaft and an idler pinion, which in turn drives the other herringbone gear. Connecting rods are attached to the slide through square-section blocks, which have vertical movement.

The base is of hollow box form so that Marquette pneumatic die cushions may be placed in it. Two pneumatic cylinders are used to counterbalance the weight of the slide.

This line of presses is to be made in all sizes from 3 to 16 in. in diameter at the main bearings. For the press shown, the crankshaft is 6 in. in diameter at the main bearings. Other specifications are: stroke, 8 in.;

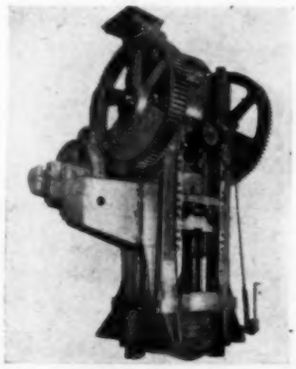


distance between uprights, 67 in.; bed opening (to suit cushion), 40x57 in.; strokes, 33 per min.; operating motor 15 hp.; height, 12½ ft.

Press, Straight-Column, Twin-Geared

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.73,p.456.] 157.

A large straight-column press intended for heavy forming, flattening, and embossing operations has been produced. The press is quite narrow, having but 43 in. between uprights. The crankshaft is of the semi-



eccentric type, 13 in. in diameter at the frame bearings and 20 in. at the crank-pin connection, which is bronze-bushed. Stroke of the ram is 16 in.

Area of the slide is 35 in. right to left by 39 in. front to back. It has a three-bar direct-acting knock-out. Adjustment is 6 in., by means of a power elevator.

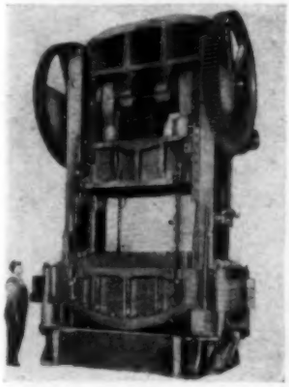
The friction clutch is integral with the fly-wheel which is mounted on Timken roller bearings. The brake, an improved clamshell type, is on the right-hand side of the press. The hand lever for operating the clutch is arranged so the press may be stopped or started at will, or be stopped automatically at the top center by simply changing the position of a small stud at the bottom of the hand lever. Lubrication to all bearings is by means of a special system utilizing a separate pipe for each bearing. The press weighs approximately 160,000 lb. It is operated by a 50-hp. motor.

Press, Double-Crank, with Adjustable Bed

E. W. Bliss Co., 53rd St. & 2nd Ave., Brooklyn, N. Y. [Vol.73,p.525.] 204.

Design improvements are: an adjustable bed with supporting blocks and the use of the main drive to set the bed; a slide with a self-contained screw adjustment, a breaker safety device; "solid connections," and a friction clutch drive without outboard wheels or brackets.

The bed may be raised by connecting it to the slide through four long bolts in the open lugs at the corners. The main



clutch is then used to move it. As many blocks as will go are then swung in. Absence of machinery in the foundation pit will commend itself to the die setter and repair man. Under the main nut is provided a space for the insertion of a safety washer. Collapse of this washer relieves the slide about ¼ in.

A motor on the crown is connected to the flywheel through a Texrope drive.

Press, Straight-Side, with Special Side Shear Attachment

Rockford Iron Works, Rockford, Ill. [Vol.73,p.574.] 249.

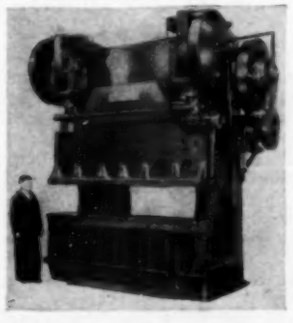
"New Rockford" straight-side presses are now available with a side shear attachment. Steel tie-rod construction is used for the frame. For the cut-off attachment shown, the stroke is 3 in. and the adjustment of the slide 2 in. With the stroke down and the adjustment up, the distance between cutter seats is 12½ in., while the center distance of slide to upright is 8½ in.

Press, Double-Crank, Single-Acting, 300-Ton

Cincinnati Shaper Co., Elam St. & Gerrard Ave., Cincinnati, Ohio. [Vol.73,p.611.] 228.

An all-steel, 300-ton, single-acting, double-crank press has been built. All main members are of rolled steel plate; the housings being 5¾ in. thick, and the bed and ram plates 4 in. thick. Welding is used throughout.

The stroke of the press is 3 in.; motorized adjustment to the ram, 6 in.; die area, 16½



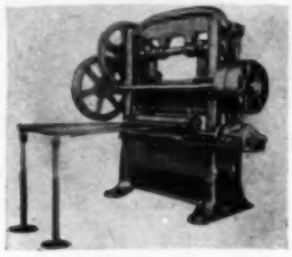
in. by 8 ft.; shut height, 20 in., and depth of throat, 10 in. Other features are: automatic oiling; V-belt drive to flywheel; bronze-bushed eccentric bearings, and the flywheel and the ram adjustment mounted on anti-friction bearings.

Press, Double-Crank, with Stagger-Roll Feed

Zeh & Hahnemann Co., Newark, N. J. [Vol.73,p.649.] 139.

For blanking small parts, such as transformer laminations, in large quantities, this double-crank power press is equipped with automatic roll feed, which permits the cutting up of the sheet without the usual preliminary slitting.

The machine produces 250 blanks per min. Five dies are used and the press makes 50 strokes per min. Feed works on the pilgrim-step principle. The press weighs 10,000 lb., provides 50 tons pressure, and



measures 48 in. between the uprights. Sheet 36 in. wide x 8 ft. long may be punched.

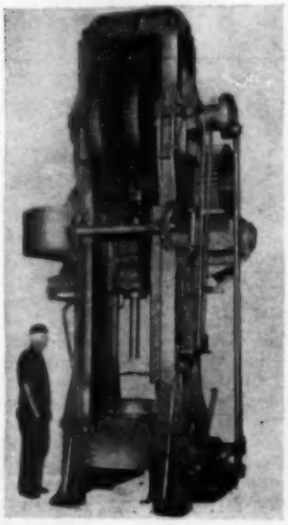
Press, Reducing, Long-Stroke, No. 906

E. W. Bliss Co., Brooklyn, N. Y. [Vol.73,p.871.] 363.

For redrawing long brass, copper, or aluminum shells at high speed, the No. 906 long-stroke reducing press with balanced gear drive has a 36-in. stroke and operates at 18 strokes per min. The drawing speed is 170 ft. per min.

Twisting of the crankshaft is eliminated by applying the driving power to the point where the cheeks would be on a regular crankshaft. In place of the cranks, two large steel gears are connected by a crankpin 18 in. from the center line of the twin gears. These gears are force fitted to journals that rotate in long bronze-bushed bearings at the point where the regular crank bearings would ordinarily be mounted. A one-piece double pinion drives the twin gears from a backshaft.

Specifications: weight of press, 41,000 lb.; adjustment of slide, 4 in.; distance, bed to slide, stroke down, adjustment up, 16 in.; diameter of shaft, at bearings, 6 in., at crankshaft,

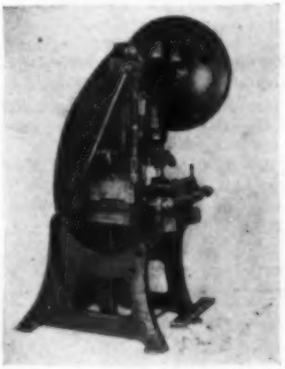


7 in.; capacity of press at mid-stroke, 15 tons; width between uprights, 24 in.; width between gibs, 23 in.; area top of bolster, F. & B. x R. & L., 26x23 in.; thickness of bolster, 3 in.; area face of slide, F. & B. x R. & L., 14½x23 in.; opening in bed, 8½ in. in diameter; floor space over-all, 90½x99 in.; motor, 40 hp., 900 r.p.m.

Press, Inclinable, with Roll Feed and Scrap Cutter

Rockford Iron Works, Rockford, Ill. [Vol.73,p.370.] 160.

A double roll feed and scrap cutter with automatic release for the feed rolls are now available for the "New Rockford" heavy-duty inclinable presses described on page 373, Vol. 73. The press is also fitted with an



automatic release brake. The feeding attachment will feed at a rate up to 6 in. per stroke, but it can be adapted to feed longer lengths.

Presses, Inclinable, Type R

Rockford Iron Works, Rockford, Ill. [Vol.73,p.373.] 151.

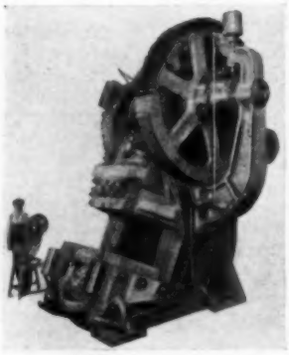
Type R inclinable presses, in sizes from Nos. 1 to 8, may be had in either the single-geared or the flywheel types. The latter may be arranged for direct motor drive to a gear on the periphery of the flywheel.

This line of inclinable presses is equipped with heat-treated crankshafts and connecting screws. The crankpin has

twice the area of the crankshaft. Other features are: sensitive cushioned band brake; ball-type connection with adjustment for wear and removable ball seat in the slide; and extra long gibs.

All sizes up to the No. 6 size are equipped with a sliding rectangular bolt clutch. Larger machines are equipped with an automatic three-jaw clutch.

In the single-geared models, a unit backshaft bracket is a feature. This backshaft is Timken equipped. A crossbar knockout in the slide is standard equipment.

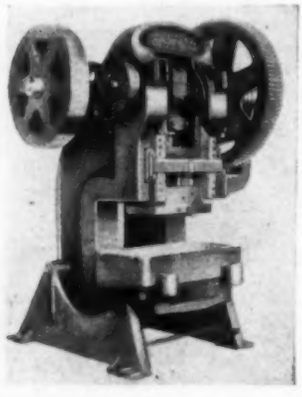


Presses, Open-Back, Inclinable, Nos. 7 and 8

Minster Machine Co., Minster, Ohio. [Vol.73,p.944.] 441.

These two units are the largest of the line, exerting ram pressures of 71 and 88 tons, and weighing 12,200 and 23,000 lb. in the single-geared models.

Main bearings in the frame overhang so that the entire upward thrust of the crankshaft is carried by the frame and not by the caps. The clutch em-



ployed on both the fly-wheel and geared types is of the block or jaw type.

The frame is raised and lowered by means of ratchet-operated screws. Both machines are equipped with a positive crossbar knockout in the slide. The slide is extra long and has heavy V-gibs. Adjustment is made from one side only. All working surfaces are provided with means for ample lubrication.

Specifications: No. 7 press—area of bolster, 23x34 in.; area of slide, 12x10½ in.; stroke, 4 in.; No. 8 press—area of bolster, 27x42 in.; area of slide, 15x16½ in.; stroke, 4 in.

Press, Inclined, Open-Back

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.73,p.227.] 22.

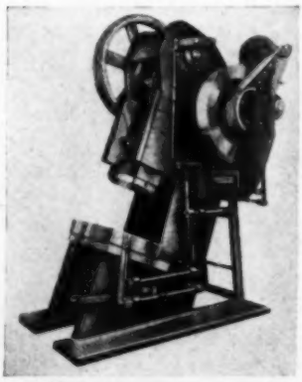
Claimed to be largest inclined open-back press built to date, this machine has a large part of the frame of the press below the floor. Specifications are: weight, 115,000 lb.; area of bed, front to back by right to left, 36x60 in.; area of slide face, front to back by right to left, 30x31 in.; width of opening in back, 36 in.; die space, stroke down and adjustment up, 18 in.; eccentric crankshaft, 10 in. in diameter at the frame bearings and 16 in. in diameter at the connection bearings; stroke, 6 in.; motor required, 25 hp., and number of strokes per min., 15.

The press is fitted with a three-bar knockout for the slide and a centralized lubrication system for the main bearings. It is direct-geared to a motor through a train of steel gears in the ratio of 24 to 1.

Presses, Permanently Inclined, Overhanging-Type, All-Steel, "Verson"

La Salle Machine Works, Inc., 3013 South La Salle St., Chicago, Ill. [Vol.73,p.1017.]

The machine illustrated is of 250 tons capacity and has an 8½-in. crankshaft, 10-in. stroke, and 14-in. depth of throat. The frame, ram, and gears are all of welded steel plate construction. Main bearings are bronze bushed and the gibs are of steel with bronze linings. Roller bearings



support the backshaft, the fly-wheel, and the flywheel support. Annular ball bearings are supplied in the pinion support. The roller bearing, multiple-disk friction clutch is equipped with an automatic safety stop designed to disengage at the top of the stroke.

The herringbone backgear and pinion are offered as standard equipment. Motor Texrope drive is employed.

Presses, Wiring

The Toledo Machine & Tool Co., Toledo, Ohio. [Vol.73,p.180.] 44.

Equipped either with or without a screw-adjustable swinging knee, these machines are being built in 15 sizes, either with or without gearing, and weighing from 1,300 to 40,000 lb. in standard patterns.

A special press is shown. The

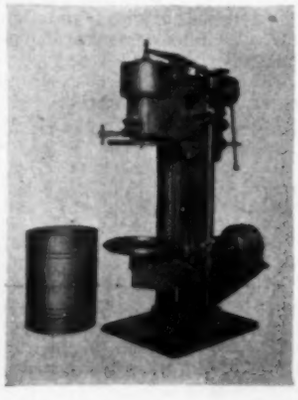
feature is the great die height, the distance from the top of the bed to the gibs being over 72 in. It has an 8-in. stroke and is controlled by a positive jaw clutch.

Seaming Machines, Double, No. 220

E. W. Bliss Co., Brooklyn, N. Y. [Vol.73,p.371.] 150.

A semi-automatic, double-seaming machine for round drums, pails, tubs, and similar articles having a diameter not in excess of 22½ in. and not thicker than 18-gage has been produced.

The machine comprises a self-contained seaming head bolted to a column with machined front face, to which may be gibbed the footstock or work-holding knee. The head carries the work spindle, driving shaft, and roll slides, together with the automatic feed machanism for the latter. Three types of feed are available.



Type A has a single-spindle footstock. This model will take work up to 22½ in. in diameter by 36 in. high by 18 gage.

Type B has a four-station dial feed and will take work up to 15½ in. in diameter by 26 in. high. Dial indexing and rise and fall of work are automatic. This machine will handle 12 to 16 heads a minute.

The Type C, with a four-station dial, takes 22½-in. diameter work. The height range is from 18 to 36 in. The dial indexes twelve times a minute.

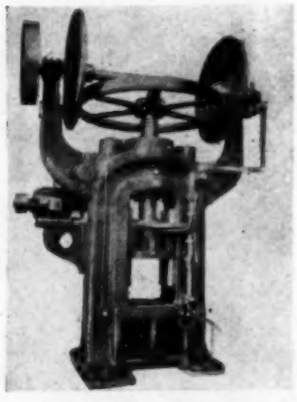
Press, Percussion

Schatz Manufacturing Co., Poughkeepsie, N. Y. [Vol.73, p.224.] 65.

A percussion press, or friction spindle press, in sizes from 25 to 1,400 tons pressure, and in open-end, double-housing, and 4-pillar designs, has been placed on the market.

The machine illustrated has a rated capacity of 500 tons; 18 in. stroke; 15 in. between the bed and ram with the ram down; a 22x31½ in. bed; a 16½x 23 in. ram surface; 12 strokes per min., and a 25-hp. motor.

Pneumatic control can be furnished, together with automatic knockouts. The machine



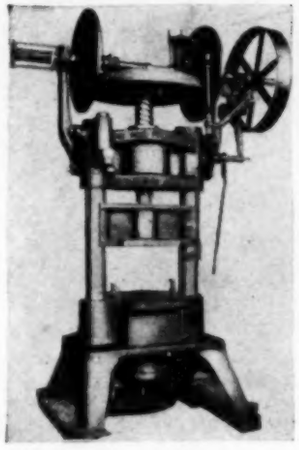
can be driven with either tight or loose pulleys from a line-shaft, or by individual belted motor drive.

Press, Percussion, Pillar-Type, No. 14-10-B

Zeh & Hahnemann Co., 182 Vanderpool St., Newark, N. J. [Vol.73,p.228.] 67.

A No. 14-10-B, pillar-type, percussion press yielding 100 tons pressure has been developed. The press has a distance between the uprights of 30 in., weight 7,500 lb., and requires a 5-hp. motor. It gives 25 strokes per min.

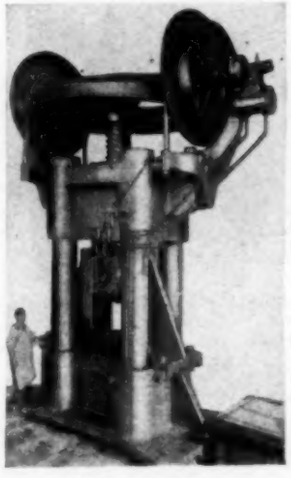
Two other sizes are also manufactured, namely; 50- and 75-ton capacities. In addition to operation on light metal work of large area, these presses are being used for prepressing Bakelite and similar materials. A pneumatic ejector removes the finished product quickly.



Press, Percussion, No. 130

Zeh & Hahnemann Co., 182 Vanderpool St., Newark, N. J. [Vol.73,p.759.] 329.

This press weighs 85 tons and is of the 4-pillar, built-up type. The 16-in. main screw is of tool steel, heat-treated. Overall height of the press is 22 ft., and it requires 75 hp. for operation. The 120-in. flywheel is



a steel casting and weighs 4 tons. Its energy amounts to 100,000 ft.-lb. This press is rated to yield 900 tons pressure normally.

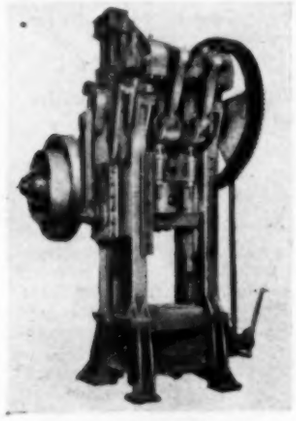
A pneumatic control is fitted to the press. It reverses the slide automatically at the end of the down stroke and stops it at the up position. The stroke is 25 in., and the press operates at 10 strokes per min., if the full stroke is utilized. An emergency brake is provided.

Presses, Toggle-Drawing, Single-Crank

E. W. Bliss Co., 53rd St. & Second Ave., Brooklyn, N. Y. [Vol.73,p.218.] 83.

The Nos. 1½ to 3¾-B single-crank toggle drawing presses have been redesigned. For the blankholder drive, the outboard bar guide for the crosshead has been discarded in favor of a gibbed guide on the frame. A further improvement is the substitution of a forked arrangement for the overhung pins of the short link.

Whereas in the older models of the Nos. 1½ to 3¾-B presses the driveshafts were placed low and close to the frame, in the improved models they have been raised and the nuts made readily



accessible with the slide in any position. A full automatic friction clutch control is now built into the right-hand leg of the machine.

The drive shaft now runs on Timken bearings. The flywheel is of improved design. The clutch is operated through the usual toggles. Greater compactness is another feature. The saving in space from right to left amounts to 22 in. for the No. 1½ and 31 in. for the No. 3¾-B. Frames on these presses have been stiffened substantially and extended at the back to get nearer the backshafts.

Press, Toggle-Joint, Foot, Type A.T.

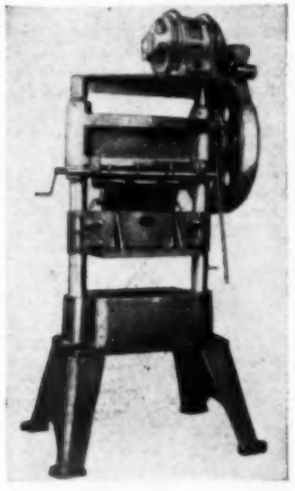
Rockford Iron Works, Rockford, Ill. [Vol.73,p.372.] 159.

The press is used for riveting and clinching operations. A special horn has been applied. Because of the slow movement of the toggle-operated slide near the bottom of the stroke, better riveting conditions prevail and the metal is allowed to flow at a slower speed than would be the case with a direct lever-operated slide. The treadle is returned to the operating position by a counterweight.

Press, Toggle, High-Speed

Zeh & Hahnemann Co., 182 Vanderpool St., Newark, N. J. [Vol.73,p.610.] 257.

Operation at 75 strokes per minute is the feature of the No. 7 toggle press with tie-rod construction. Normal pressure ex-



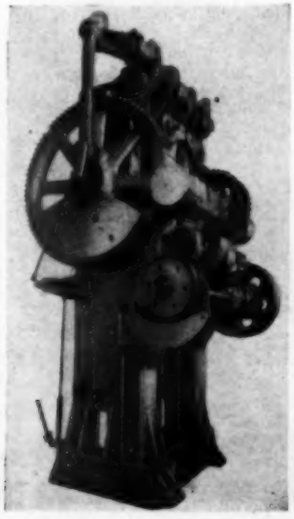
erted is 50 tons. Specifications are: weight of press, 4,500 lb., distance between stanchions, 26 in., stroke of slide, 1½ in., adjustment of slide, 1½ in., and motor required, 3 hp.

Press, Toggle-Drawing, Single-Crank, Double-Action

Toledo Machine & Tool Co., Toledo, Ohio. [Vol.73,p.908.] 408.

This gigantic single-crank, double-action, toggle drawing and deep stamping press weighs 450,000 lb., and requires a 200-hp. motor. The toggle mechanism that operates and controls the dwell of the blank-holder slide is located in the crown.

The press is operated by the Toledo patented multiple-disk

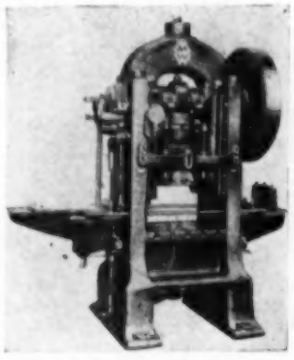


friction clutch with independent brake. Stroke of the plunger slide is 45 in., with an adjustment of 10 in. Distance between the uprights is 69 in., and the plunger is 50 in. front to back by 42 in. right to left; the blank-holder is 68 in. front to back by 57 in. right to left, and the top of the bed to the bottom of the plunger slide, with the stroke down and adjustment up, is 80 in. The thickness of the bolster plate is 8 in. The crankshaft is sufficiently large to permit drawing stainless steel shells 24 in. in diameter by 24 in. deep by ½ in. thick.

Press, Automatic-Feed, High-Speed, with Grip Feed

The Schatz Manufacturing Co., Poughkeepsie, N. Y. [Vol. 83,p.533.] 238.

Five sizes are included in the line. These sizes will exert pressures up to 35, 55, 90, 140, and 225 tons, respectively, with speeds up to 300 strokes per minute for the smallest machine and 75 strokes per minute for the largest. There are two sliding carriages connected by bars, and on each side is a grip lifted by cams. In each housing is a fixing grip for holding



the material while it is being punched. At the extreme right is a scrap shear adjustable to cut the strip at its weakest point.

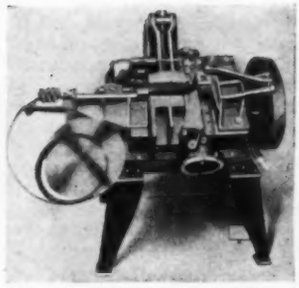
Maximum space in the bed is provided for stacking devices, which are motor driven on the larger models. High die-space is provided, and the ram is adjustable.

Press, Automatic-Feed, Six-Slide, Heavy-Duty, No. 2

Velefor Press Works, 2126 Stanley Terrace, Union, N. J. [Vol.73,p.979.] 473.

For both large and small quantity production, the No. 2, 6-slide heavy-duty automatic press has a heavy ram and bolster with a flywheel arrangement that resembles a heavy-duty press for blanking and piercing. The straightener, feed with check, cut-off mechanism,

Punching, Shearing, and Slitting Machines



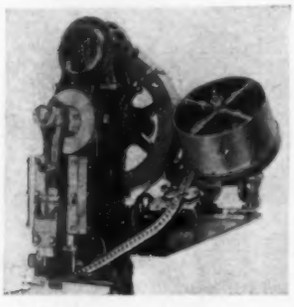
four forming slides, and the stripper are somewhat similar to a heavy-duty press for forming.

Specifications: capacity of ram, 10 tons; capacity of slides, 1 ton; largest width of strip, 2 in.; largest stroke of feed, 4½ in.; ram stroke, ⅜ in.; cut-off slide stroke, 7/16 in.; stroke of front and back forming slides, ¾ in.; stroke of side forming slides, 1¼ in.; power required, 2 to 3 hp.; weight, 1,600 lb.; and floor space, 42x60 in.

Press Feed, Clinch-Nut

F. J. Littell Machine Co., Chicago, Ill. [Vol.73,p.186.] 42.

By the use of a patented turnover mechanism, flat-sided clinch nuts can be fed rapidly into a punch press. These nuts are fed from a hopper down through a curved slot, and as they slide down they are

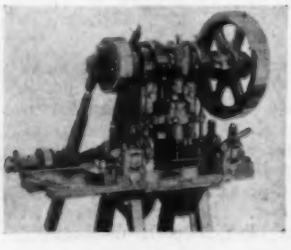


straightened by the patented Littell turnover and enter the punch press in the right order.

Press Feed for Shaped Strip Stock, Double-Roll

F. J. Littell Machine Co., Chicago, Ill. [Vol.73,p.229.] 43.

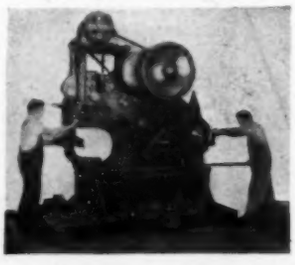
This double-roll feed mechanism is suitable for feeding shaped strip stock which may be light and soft. For example, soft-aluminum shaped strip stock may be fed with a drive on the rear of the press, so that small holes can be punched at frequent intervals.



Punch and Shear, Combination, Type MA-20

Henry Pels & Co., 90 West St., New York, N. Y. [Vol.73, p.301.] 123.

Capacity at the punch end for 1-in. holes through 1-in. steel plate and a throat depth of 24 in. adapt this special type MA-20 combination punch and shear to punching in webs and flanges of Bethlehem beams up to 30 in. and H-columns up to 14 in. The machine will also punch webs and flanges of Carnegie C. B. sections up to 36 in. in



height and 16-in. width of flange.

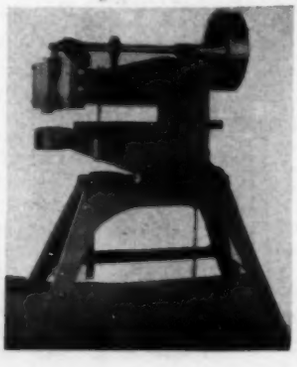
The angle shear has a double-spindle hold-down, and the plate shear has a crank and worm-operated hold-down. Rollers in the horizontal plate-splitting channel facilitate feeding of large and heavy plate. The capacity of the angle cutter is up to 6x6x⅝ in. angles, square cut.

A feature is a set of die-blocks and punch-holders especially adapted to the high throat and designed to cover the range of structural shapes with the least number of changes of set-up.

Punch Press, No. 4

R. M. Clough, Meriden, Conn. [Vol.73,p.911.] 420.

Holes from ¼ to 4 in. in diameter can be punched in No. 16 gage with the No. 4 punch press. The machine is fitted with an adjustable slide, having a 1-in. adjustment, and fitted with a 1-in. hole to receive shanks of the larger size



punches. Dies are made rectangular for punching 2¼ to 4 in. in diameter. For sizes from 2 7/16 to ¼ in., round dies, using a cast-iron holder, are employed.

The clutch is so designed that it will engage the bolt in the flywheel at each one-half revolution. Two throat sizes are manufactured, 18 and 24 in.

Punch, Web, Hydraulic, Portable

Messinger Bearings, Inc., D St. above Erie Ave., Philadelphia, Pa. [Vol.73,p.263.] 72.

Holes up to 1 1/16 in. in diameter can be punched through 1-in. plate by use of this hydraulic web punch. This is effected by applying a 110-lb. pressure at the end of the 30-in. pump

handle. With each stroke of the handle, the ram travels approximately 3/16 in.

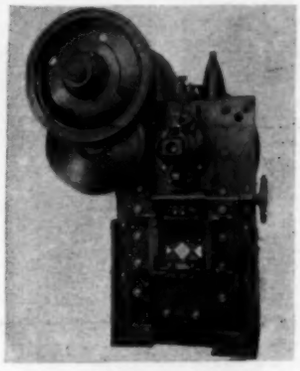
All working parts are removable and interchangeable. The punch is designed with a system of valves whereby a unit hydraulic pressure of 30,000 lb. per sq.in. can be developed.

Shears, Bar and Billet, Types FV-35 and FV-42

Henry Pels & Co., Inc., 90 West St., New York, N. Y. [Vol.73,p.336.] 124.

These shears have capacities for 4 and 4½ in. rounds. Frames are of unbreakable steel plate construction. Gearing and flywheels are placed overhead. Twin flywheels are employed to obtain smooth operation. A three-jaw clutch actuates the machine. Operation is ordinarily by means of a hand lever. A brake is mounted on the end of the eccentric shaft and stops it automatically in the highest position.

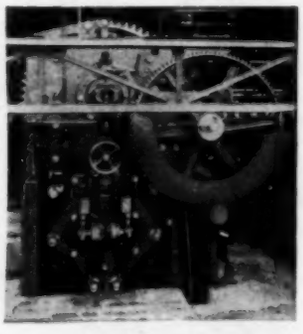
Specifications: size 35, strokes per min., 22; length of stroke, 3½ in.; power required 12 hp.; net weight, 12,100 lb.; length, 71 in.; width, 63 in.; height, 102 in.; size 42, strokes per min., 22; length of stroke, 3½ in.; power required, 15 hp.; and net weight, 15,400 lb.



Shears, Billet, Improved, Type FV

Henry Pels & Co., Inc., 90 West St., New York, N. Y. [Vol.73,p.534.] 195.

Cleaner cutting off of alloy bar stock is effected by new style knives on the Type FV heavy billet shears. Among the features is a band brake on the



eccentric shaft controlled by the clutch mechanism. A special backlash pin is built in the clutch. Knives can be furnished for cutting square as well as round stock.

Shear, Rotary, No. 7

Quickwork Co., St. Mary's, Ohio. [Vol.73,p.376.] 162.

This rotary shear for trimming stampings is made in four designs, A, B, C, and D, all having a capacity of 14 U. S. gage and lighter, and having two speeds.

In all designs the shear body proper is the same, but the mounting and control are furnished in different arrangements. There is also a choice between hand lever or foot control. Belt and motor drive ar-

rangements are identical on all designs.

The distance from cutting edges of cutters to the back of the shear jaw is 17 in. A 1-hp. motor is required. Net dimensions, less the motor mount and extension pipes, are 30x20x32 in. high. Approximate net weight is 1,000 lb. Cutting speeds are from 8 to 22 ft. per min. Vertical depth of the throat is 7 in., and the horizontal depth, 10 in.

Shear Bearings, Fulcrum-Pin, Improved

Canton Foundry & Machine Co., Canton, Ohio. [Vol.73,p. 612.] 248.

In order to simplify rebushing of the fulcrum-pin bearings on its alligator shears, the above company has developed a split gun-metal bushing. A step-

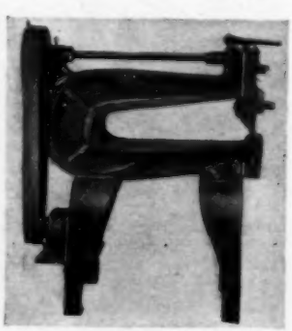
down fulcrum pin is now used, which when assembled in the shear with the two castellated nuts, serves as a tie to prevent the shear bed from spreading when rebushing.

Cutters, Metal, "New Series," Gray

W. J. Savage Co., Inc., Knoxville, Tenn. [Vol.73,p.264.] 77.

The No. 136 is the same as the No. 130, except in capacity and depth of throat. The capacity of the No. 130 is ½ in. in mild steel and the No. 136, ⅜ in., the depths of throat being 30 and 36 in. The No. 2 roller-die machine is suitable for cutting large sheets from ⅜ to ⅝ in. thick. All machines will cut any flat shape from steel, nonferrous metals, and tough alloys.

The headed nibbling tool and the toolholder assembly prevent



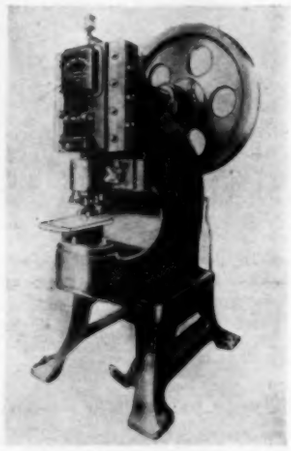
the tool from pulling out or working loose. Tool bushings permit the tool to be reshaped four times. The turret head permits turning the cutting edge of the tool in any direction to cut any shape without turning the material. A tripod table for cutting circles from 2 to 50 in. radius and for cutting straight lines can be furnished.

Nibbling Machine, No. 3

A. C. Campbell, Inc., Bridgeport, Conn. [Vol.73,p.417.] 184.

Sheet metal from ⅛ to ¼ in. in thickness can be handled on the No. 3 nibbling machine. The machine cuts at approximately 20 linear in. per min., and like the smaller machine it works on the circular punch and die principle, with a pilot to prevent the work from slipping and the punch from taking too large bites.

Circles can be accurately and easily cut with the circle cutting attachment. The machine has three strokes, 1 in., 1⅛ in., and 1¼ in. The ¼-in. punch can be



set quickly in the die by turning the stroke adjustment collar.

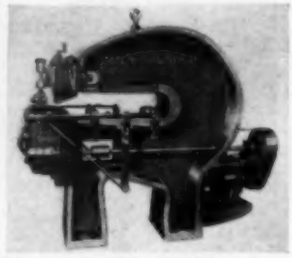
Specifications: Floor space required without motor, 5 ft. x 4 ft. 2 in.; height over wheel, 8 ft. 6 in.; depth of throat, 15 in.; hp. required, 7½; net weight, belt drive, 9,000 lb.

Shear, "Stanley-Unishear," Model B

Stanley Electric Co., New Britain, Conn. [Vol.73,p.649.] 299.

Straight lines, curves, designs, and inside contours on heavy flat stock up to ¼ in. can be cut on the Type B "Stanley-Unishear." All of these operations can be performed at speeds up to 10 ft. per min., and complete circles can be cut to a minimum radius of 6 in. on ¼ in. material, and less than 3 in. radius on thin material.

The frame is provided with a throat 36 or 50 in., and the upper head unit carries the stationary



blade. An oscillating rocker is carried in the lower head unit with its blade and driving mechanism.

Slitting Machine, Rotary

Putnam Machine Works, Division of Manning, Maxwell, Moore, Inc., Fitchburg, Mass. [Vol.73,p.67.] 18.

This slitter is designed to trim the sides or to slit mild steel plates into multiple strips. Sheets to ⅛ in. thick can be handled. Two housings carry a pair of cutter arbors; and two sets of feed rolls keep the sheets and strips flat and straight while going through the cutters. Two operators are commonly required. Feed rolls are arranged with vertical adjustment.

The machine is arranged with open-end arbors. One end housing is on ways and is easily removable. The stripper

finger bracket also swings out of the way for changing cutters.

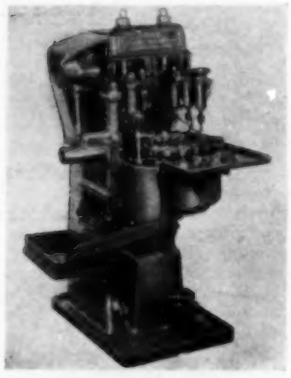
This machine is furnished in four sizes for handling sheets 24, 36, 48, and 60 in. wide.

Threading Machines

Tapping Machine, Dial, Turret-Type

Globe Tapping Machine Co., 488 John St., Bridgeport, Conn. [Vol.73,p.454.] 183.

Except for a turret-type dial and horizontal spindle at the side, the Globe dial tapping machine is the same as the model described on page 351, Vol. 72.



This dial is of the turret type, with revolving fixtures for holding the work. Parts can be tapped and countersunk at any angle on the periphery. For holes parallel with the fixture axis, a horizontal spindle attachment has been applied.

Tapping Machine, Nut, Double-Spindle, Automatic, No. 1

Automatic Nut-Thread Corporation, Philadelphia, Pa. [Vol. 73,p.610.] 240.

From ¼ to ⅞-in. U.S.S. or S.A.E. hex and square nuts can be tapped on this unit, which uses bent-shank taps. Both

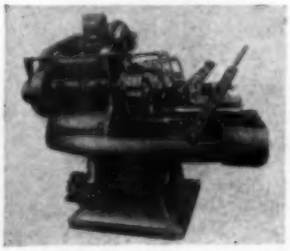
tapping spindles are fed by a rotary disk hopper.

Change gears are provided for changes in tapping speed or lead. All gears are of steel. The standard machine is furnished with a single clutch pulley for belt drive. Provision is made for motor drive. Nuts can be tapped to a Class 4 close fit.

Threading Machine, "Bolt Factory"

Landis Machine Co., Waynesboro, Pa. [Vol.73,p.262.] 95.

This machine has been redesigned to include a constant-speed motor drive and a pick-



off gearbox. Fifteen threading speeds ranging from 38 to 271 r.p.m. are available when using eight sets of interchangeable gears.

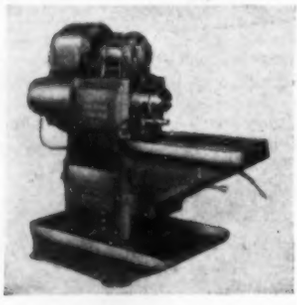
The machine is made in 1-in. and 1½-in., triple-spindle models.

Threading Machine, Precision, No. 98

Murchey Machine & Tool Co., Detroit, Mich. [Vol.73,p. 570.] 229.

Capacity to cut ¼- to 1¼-in. threads in lengths up to 3 in. is embodied in this machine for accurate "cut threads."

Cutting action of the chasers is governed by a hardened and

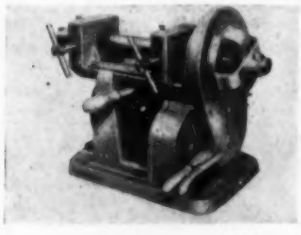


ground leadscrew ground to within 0.0001 per in. of lead, and mounted directly on the spindle. The segmental lead nuts open and close in a manner similar to the chasers in a self-opening diehead.

Threading Machine, Pipe, 2-In.

Axelson Manufacturing Co., Ltd., Los Angeles, Calif. [Vol. 73,p.222.] 86.

Contrary to the usual arrangement, this 2-in. pipe threading machine rotates a standard square die while the pipe remains stationary. Thus, long pieces of assembled pipe or

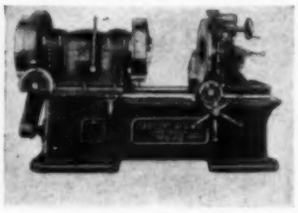


bent pipe can be threaded conveniently. Two jaws grip the work, these jaws being practically automatic in action.

Threading Machine, Pipe, High-Speed, No. 8-HD

Jarecki Manufacturing Co., Erie, Pa. [Vol.73,p.261.] 96.

This machine employs one adjustable, self-opening diehead, which covers the entire standard range of 2½ to 8 in., as well as

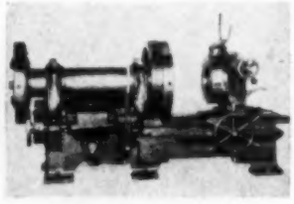


the extra range of 1½ to 2-in. pipe threads. A forged steel trigger, extending inside the diehead, opens the die automatically when the correct length of thread has been cut. Average threading speed is 29 ft. per min. Small chasers are held rigidly in the large die-holder, and are only 2¼ in. wide, thus effecting savings in tool steel. The cutting-off block is mounted securely in a slot back of the diehead support. At present 8-in., 6-in., and 4-in., and 12-in. sizes are available.

Threading and Cutting-Off Machine, Pipe, Duplex, Improved, No. 8

Bignall & Keeler Machine Works of the N. O. Nelson Manufacturing Co., Edwardsville, Ill. [Vol.73,p.529.] 181.

Cutting and threading pipe and casing from 2½ to 8¼ in. can be done. This machine is equipped with a Peerless sliding diehead with expanding dies. Eight speed changes are provided. A two-way positive



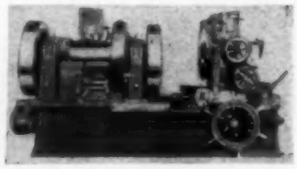
clutch has both fast and slow positions. A three-jaw independent chuck is mounted on each end of the arbor. The rear chuck has special flange grippers for making up flanged fittings.

Floor space occupied is 57x 110 in. The spindle has a 10-in. through hole. Carriage travel is 20 in. The power required is 5 hp. and the weight is 7,500 lb.

Threading and Cutting-Off Machine, Pipe, 8-In.

Landis Machine Co., Inc., Waynesboro, Pa. [Vol.73,p. 605.] 243.

Long-length tapered threads now in use on high-pressure pipe and seamless tubing can be cut on this 8-in. threading and pipe-cutting machine. It has a receding-chaser, two-cut diehead and a lead-screw attachment. A chaser 1⅛ in. in width is employed regardless of the total thread length. The diehead is

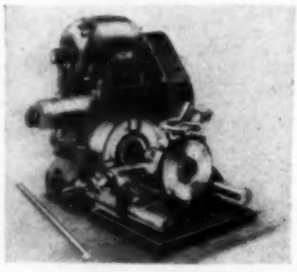


a two-cut type, which permits of roughing and finishing cuts without any change in the diametrical adjustment. In addition, there is a universal micrometer adjustment for gage fits. A plug provides a positive means of locating the sine bar for ⅞-, ¾-, and ¾-in. tapers per ft.

Threading Machine, Pipe, "Tom Thumb"

The Oster Manufacturing Co., Cleveland, Ohio., and the Williams Tool Corporation, Erie, Pa. [Vol.73,p.530.] 231.

Although the machine will cut off, thread, ream, and chamfer all sizes from ¼- to 1¼-in. pipe, its over-all dimensions are only 18½ in. in height, 16 in. in



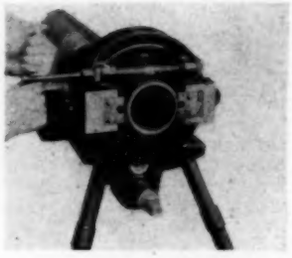
width, and 23½ in. in depth. The ½-hp. "Domestic" universal motor automatically adjusts its speed to the pull on the dies.

A special bolt chuck for ⅜- to 1½-in. bolts has been designed.

Pipe, Cutter, Square-End, 2½- to 4-In., No. 104, "Beaver"

The Borden Co., Warren, Ohio. [Vol.73,p.725.] 312.

Replacement of the No. 10 Beaver cutter has been made with the No. 104. The latter tool is centered automatically on

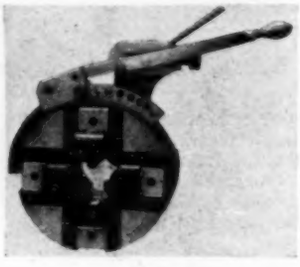


the pipe by means of V-jaws and does not employ bushings. The No. 104 cutter is designed primarily for power use, but it can also be used as a hand tool.

Diehead, Pipe Threading, "Bikeko"

Bignall & Keeler Machine Works of the N. O. Nelson Manufacturing Co., Edwardsville, Ill. [Vol.73,p.1021.] 484.

"Bikeko" dieheads can now be furnished on new Peerless and PDQC machines and for any heavy power-driven threading machine in service. One upward movement of the die lever lifts all the dies clear of the pipe and coupling. A positive lock on the screw adjustment assures



accurate duplicate threads after adjustment is once made for a given size. A fine pitch adjusting screw is provided for standard or special sizes. High-speed steel dies with curved eccentric relief reduces friction to a minimum and allow high cutting speeds. Die slides have long travel, allowing one set of dies to handle all sizes within the capacity of the head.

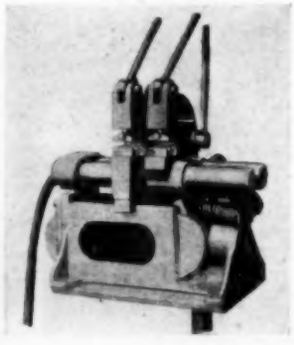
Welding Machines

Welding Machine, Butt, Portable, "Micro-Weld"

Micro Products Co., Peoria, Ill. [Vol.73,p.185.] 29.

The Model E weighs only 45 lb., and will weld wire from Nos. 4 to 20, whereas the Model T will handle from ¼- to ⅜-in. wire. By turning the barrel on the Model E about three revolutions in the direction indicated for space, the dies are opened to the fullest extent, about 1¼ in. In this space, high-carbon wires, which have been welded previously, can be annealed. Special annealing dies can be had for the Model T. Tungsten contact tips replace copper ones.

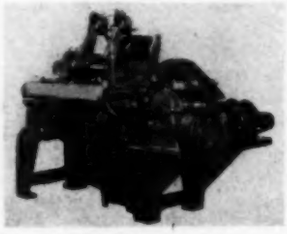
Capacity of the Model E is 2½ kw., Model T, 7 kw.



Welding Machine, Butt, Universal, Power-Driven

Thomson-Gibb Electric Welding Co., Lynn, Mass. and Bay City, Mich. [Vol.73,p.939.] 419.

This power-driven butt welder is practically a universal machine. It is suitable for the butt welding of certain classes of rims, or for the welding of comparatively wide thin sections of strip stock. It is equipped with universal-type, air-operated, open-end clamps and a 200-kva., water-cooled transformer. Dies and jaws will take up to 7-in. wide stock, and jaws are so mounted that they can be removed quickly and replaced.

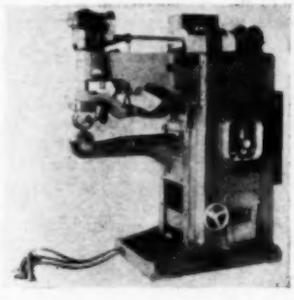


The drive consists of a 2-hp. motor connected by belt to a gear reduction unit. Normal operating speed is 10 to 15 r.p.m. for the pressure cam. The valve for operating the clamps is controlled by a treadle. Capacity of the machine is approximately 2 sq.in.

Welding Machine, Seam, No. 4 HDA

Thomson-Gibb Electric Welding Co., Lynn, Mass., and Bay City, Mich. [Vol.73,p.494.]

The driving mechanism is made up of independent units suitably housed for lubrication purposes and removed easily for repair. It consists of a motor, a 4-speed change gearbox for the welding speeds, a worm reduction unit, a driving head unit, a three-speed change gearbox for changing the interrupter speeds, and a current interrupter. Welding speed can be changed without altering the number of current interruptions per inch of weld.

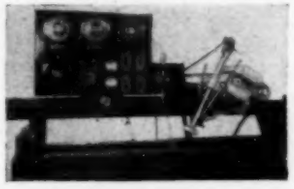


An extra upper welding roll and shaft assembly are furnished to minimize down time. Either a straight- or a circular-seam lower arm can be placed in the lower arm holder.

Welding Machine, Seam,

General Electric Co., Schenectady, N. Y. [Vol.73,p.606.] 254.

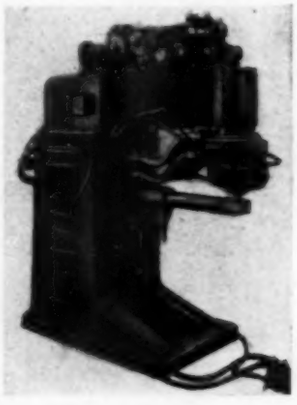
This is the first automatic equipment for this process. It is designed for longitudinal seam welding of all kinds. It consists of a clamping mechanism for holding the work, an automatic travel carriage, a welding head, the usual control devices, and other accessories. In addition, there is an auxiliary feeding device for feeding filler rod into the arc. Striking of the arc, movement of the travel carriage, and the length of the arc are all controlled automatically.



Welding Machine, Seam Automatic, Atomic-Hydrogen

The Federal Machine & Welder Co., Dana Ave., Warren, Ohio. [Vol.73,p.801.] 360.

Sixteen-point heat regulation through a separate regulating coil is a feature of these seam welders. Models are available from 50 to 150 kw., and can be operated at speeds of 10 to 30 ft. per minute on 16 to 24 gage.



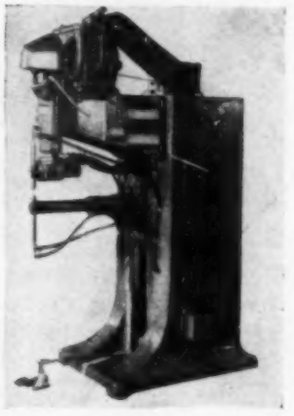
Throat depths from 24 to 48 in. are available.

Features include: pressure supplied by air through a toggle device; water-cooled current carrying parts, and either or both rolls driven.

Welding Machine, Spot, Automatic, No. 2

Thomson-Gibb Electric Welding Co., Lynn, Mass., and Bay City, Mich. [Vol.73,p.496.]

This automatic spot welder has the driving mechanism mounted at the top. Standard throat depths are: 12, 18, 24, 30, 36, and 42 in., and the machines are powered with either a 60- or a 100-kva., water-cooled transformer, affording a maximum welding capacity on the first machine of two thicknesses of No. 10 gage.



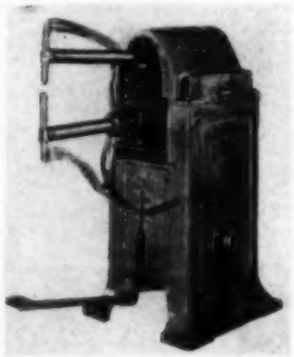
Short throat-depth machines make as many as four projection welds at one stroke on 14-gage stock, the four projections being within a 4-in. radius.

Drive is effected by means of a motor, a four-speed change gearbox, and a worm reduction unit. Any one of five 4-speed combinations are available. The slow-speed combination gives from 15 to 30 spots per minute and the fastest combination from 60 to 130 spots per minute. This machine can deliver pressures up to 2,000 lb. An indicating pressure scale facilitates recording of pressures for resetting purposes.

Welding Machine, Spot, "Standard"

The Lenney Machine & Manufacturing Co., Warren, Ohio. [Vol.73,p.609.] 255.

The Type A.M. standard spot welder, is suitable for duty up to 25 kva. and will weld two sheets up to $\frac{5}{16}$ in. thick. It is made in the pedal and automatic types. The regular horns on this machine are 18 in. long. The maximum distance between the horns is 12 in. Points are interchangeable and water-cooled. Floor space required is 24x40 in., and the shipping, 1,000 lb.

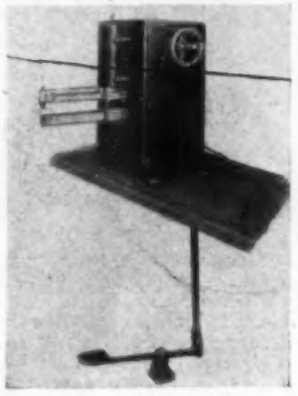


The Type A.L. standard spot welder is a 10-kva. model that will weld two pieces of 16 gage or lighter. The horns on this machine are 12 in. in length. Maximum distance between the horns is 10 in.

Welding Machine, Spot, Type B-5, "AmerTran"

American Transformer Co., 178 Emmet St., Newark, N. J. [Vol.73,p.799.] 355.

The compact sheet-steel case requires a space of only 12x14 in., and it stands 28 in. high. Two electrodes protrude 15 in. from the front. The device operates from a standard 220-volt, 50-, or 60-cycle circuit, and is available in three sizes—5, 7½, and 10 kva. Standard equipment includes a pedal control and a six-point primary switch for adjusting the welding current.

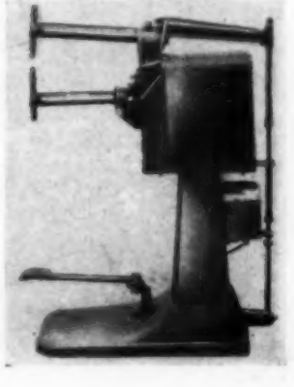


The machine is capable of welding two sheets of steel $\frac{1}{8}$ in. thick or less, or two sheets of copper or brass of $\frac{1}{16}$ in. thickness, with a ¼-in. spot weld.

Welding Machine, Spot, Light-Duty

Federal Machine & Welder Co., Dana Ave., Warren, Ohio. [Vol.73,p.872.] 361.

Throat depths from 6 to 12 in., and capacities from 5 to 7½ kw. are available in this line of light-duty spot welders. These welders are supplied with six-point heat control to allow welding from 30 to 16 gage. Either water-cooled or solid horns and points can be had.

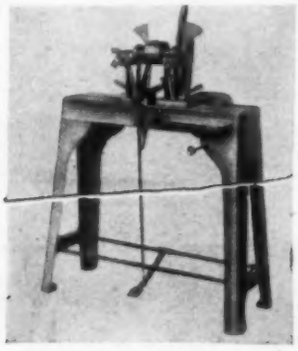


Other Machines

Balancing Machine, Dynamic

Globe Tool & Engineering Co., Dayton, Ohio. [Vol.73,p. 340.] 141.

The value of unbalance is read directly on the machine and the spot for correction is also located accurately. One operator reading values can keep



two or more others busy making the necessary corrections.

The machine is designed with a locking brake to speed the taking of readings, and permits reading and locating values as low as five grains. Size No. 1 will read unbalance in armatures from 2 in. to 7 in. in diameter and in shaft lengths of 30 in. between bearings. The shaft extensions may be 4 ft. over all. No. 0 is for diameters of 2 in.

Balancing Machine, Static

Zencromatic Co., subsidiary of the Jenkins Machine Co., Sheboygan Falls, Wis. [Vol.73,p. 797.] 371.

Production of 350 balanced flywheels or clutches per day can be obtained from this static balancing machine. A knife edge is located at the center of the part to be balanced so that the part simply tips.

The machine does not require any central work arbor. The work rests on two or four rolls, which are adjustable in line with the center of the knife edges, so as to bring the work to be balanced in line with them. After the heavy point on the

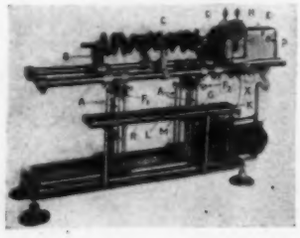
work has been located, the part is turned by hand about 90 deg., and in this location the sliding weights are adjusted to effect a balance of the scale beam.

The standard machine is made for parts 20 in. in diameter, and in several sizes from 7 to 31 in. in width.

Balancing Machine, Dynamic, Electric-Spark, Semi-Automatic, Special, Olsen-Lundgren

Tinius Olsen Testing Machine Co., 500 North 12th St., Philadelphia, Pa. [Vol.73,p. 1021.] 496.

An 8-cylinder crankshaft can be balanced to within 0.05 oz.-in. on the special Olsen-Lundgren dynamic balancing machine illustrated. The new machine has great sensitivity, neat appearance, fast testing ability, and is very convenient in operation. The older model, described on



p. 877, Vol. 70, is not superseded by the present offering.

Dynamic balancing machines of the type are available in five sizes for other work. Capacities are as follows: No. 2—10 to 50 lb.; No. 3—30 to 175 lb.; No. 4—150 to 750 lb.; No. 5—500 to 2,500 lb., and No. 6—2,000 to 10,000 lb.

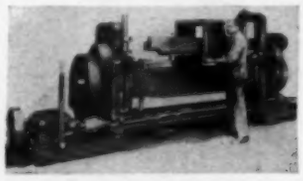
The machine consists of a vibrating frame carried on flexible members slidably mounted on the base. The vibrating frame comprises two horizontal shafts, the roller brackets, the center steadyrest for preventing excessive whip of long crankshafts, the driving means, and the mechanism comprising the phase-angle shifter in the cabinet. This vibrating frame may be locked at either end of the part to obtain the amount of unbalance at the other end. The machine employs a known weight moving radially to the drive shaft axis and the amount of unbalance can be spread directly by vernier to 0.05 oz.-in.

Brake, Rounding and Box Forming, Universal

Schatz Manufacturing Co., Poughkeepsie, N. Y. [Vol.73, p.223.] 66.

A folding type brake for bending and rounding sheet metal and plate up to $\frac{3}{8}$ in. in thickness has been placed on the market. Models are available in widths from 40 in. to 16 ft., and they can be had with and without a swing-out top bar for the purpose of withdrawing closed forms that are bent around it. Boxes with inside or outside flanges can be quickly and neatly made.

The high lift of the top bar,



the low drop of the bottom bar (both by power), and the far outward adjustment of the folding bar, or bending leaf, are important features. These movements permit the insertion between the bars of special rectangular mandrels for sharp bends, and round mandrels or rounding blades for radius bending. Bulky work, and work with high flanges, can be accommodated.

These machines are made for both hand and power operation.

Brake, Folding, Automatic, Schuler

J. I. Bernitz, 47 West St., New York, N. Y. [Vol.73,p. 339.] 132.

A folding brake for bending, round-bending, and rolling of cylindrical, slightly conical, and similar tubes has been placed on the market by the Schuler Works, represented in the United States and Canada by the above concern. This type machine is built in numerous sizes for materials up to $\frac{1}{8}$ in. thick and in working lengths up

to 13 ft. The bending leaf can be adjusted to bend uniform angles between 0 and 180 deg. The bending blades rest in longitudinal grooves in the top leaf. The bending leaf is suspended on steel spindles which rotate on steel pivots. Machines can be arranged with a swing-out top leaf. Heavier machines for material up to $\frac{3}{16}$ in. in thickness are also made.

Brakes, Steel, Hand, "Chicago"

Dreis & Krump Manufacturing Co., 74th St. & Loomis Blvd., Chicago, Ill. [Vol.73,p. 902.] 436.

Electric arc welding has replaced riveting of all rolled steel sections on the "Chicago" steel brakes. A new type ad-

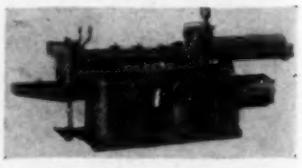
justing link provides four times the adjustment of the old eccentric link, and is a feature used in connection with special bending.

These brakes are now made in 24 standard sizes, in capacities ranging from 3 to 12 ft. long and capable of bending up to 12 gage. The upper jaw is adjustable forward and backward. Bars on the bending leaf are removable to allow for forming reverse bends as narrow as $\frac{1}{4}$ in. Provisions are made at both ends to accommodate work on which a crosswise flange has been bent.

Broaching Machine, Horizontal, "Twin-Twelve"

The Oilgear Co., 655-667 Park St., Milwaukee, Wis. [Vol.73,p.217.] 81.

Considerable difference in construction is evident in the "Twin - Twelve" horizontal broaching machine from that shown in the "Twin-Ten" machine described on p. 231, Vol. 66. It is adapted for high speed broaching of small and medium size parts.



General specifications: normal pulling capacity, 12,000 lb.; peak pulling capacity, 15,000 lb.; stroke adjustable from 6 to 36 in.; pulling speed adjustable from 48 to 396 in. per min.; distance between draw heads, 10 in.; holes in faceplate, 4 in. in diameter; distance between ways, 6 in.; vertical adjustment of cross-heads, 1¼ in. above or below center-line; floor space, 32x120 in.; net weight of motor-driven machine, 4,800 lb., and motor required, 10 hp. at 860 r.p.m.

Broaching Machine, Horizontal, Type XL-12

The Oilgear Co., 655-667 Park St., Milwaukee, Wis. [Vol.73,p.719.] 301.

High-speed broaching of small and medium-size parts can be done on the Type XL-12 horizontal broaching machine. Sturdy construction, convenient control, adjustable pulling speed, high return speed, and produc-

tion to close limits of finished parts are design features.

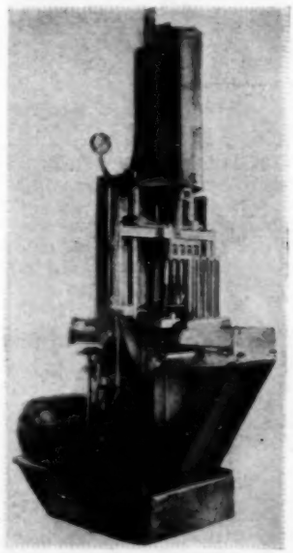
The normal pulling capacity is 12,000 lb., and the peak pulling capacity 15,000 lb. The pulling speed is variable from 4 to 33 ft. per min., and the maximum return speed is 70 ft. per min. The maximum stroke is 48 in., and the distance between the ways, 7 in.

Specifications: Diameter of holes in face plates, 4 in.; vertical adjustment of crossheads, 1¼ in. above or below centerline; floor space required, 25x147 in.; net weight, approximately 3,600 lb.; and motor required, 10 hp. at 860 r.p.m.

Broaching Machine, Full-Automatic, V-18, with Magazine Feed

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 73,p.874.] 401.

Four parts at a time are broached on the V-18 full-automatic broaching machine. This machine is fully automatic in

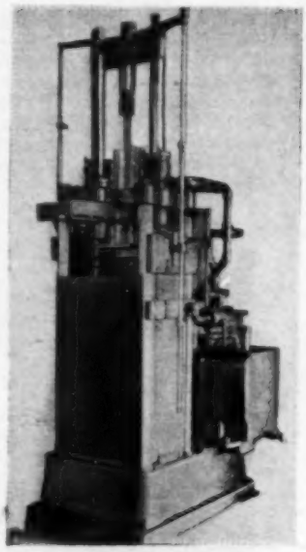


operation and works on the same principle as the type V-50 broaching machine. (See next item.) The only difference is in the smaller size.

Broaching Machine, Full-Automatic, Type V-50

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 73,p.909.] 400.

Parts dropping into a tube fill the magazine, below which is an automatic slide controlled by a hydraulic cylinder. When



the slide is in its outer position receiving the work, the broach shank is in its lower position. The slide then moves inward, carrying the work into position. The broach immediately rises by means of a hydraulic cylinder in the base, and connects into an automatic pull head.

After the broach has passed completely through, the work slides down a chute. The ram immediately returns to the starting position, and releases the broach into a receptacle, after which the 12-second cycle is repeated.

Burnishing Barrel, Spiral-Gear-Drive

Crown Rheostat & Supply Co., 1910 Maypole Ave., Chicago, Ill. [Vol.73,p.531.] 209.

A spiral gear drive has been applied to the burnishing machine built by this company. The machine was originally de-

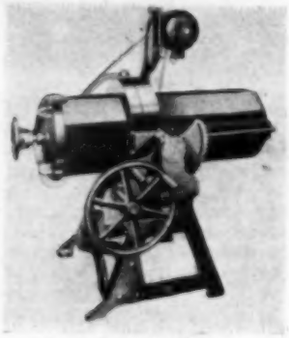
scribed on p. 1043, Vol. 72. It is capable of burnishing about one bushel of parts at a time in the No. 1 model and three bushels in the No. 2 model. Both machines are equipped with clutch pulleys.

Burnishing Machines, Ball, No. 2

Lasalco, Inc., 2822 La Salle St., St. Louis, Mo. [Vol.73,p. 761.] 338.

The barrel is supported near the center on a heavy roller bearing. It is lined with 1-in. hard maple or welded steel, or comes unlined. The cast steel cover is attached to the barrel by means of three lever clamps.

Drive is by a ¾-hp. motor mounted on a vertical standard. The motor is belted to a pulley which revolves the barrel through a bevel pinion and large ring gear.

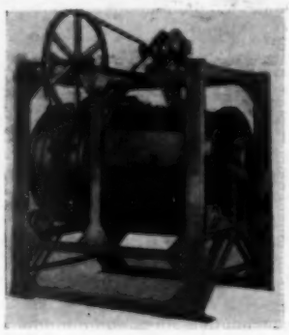


The barrel is 42 in. long by 12 in. in diameter inside. Floor space, 48x57 in.; weight, 1,100 lb. with the motor.

Burnishing Barrels, Ball, "Ideal"

N. Ransohoff, Inc., Cincinnati, Ohio. [Vol.73,p.911.] 427.

Quantity production of burnished parts can be done with the "Ideal" ball burnishing barrels. The work is run in one direction until a perfect burnish



is obtained. The operator reverses the barrel to discharge the work. Work and balls are separated automatically. Rotating the barrel again in the running direction automatically returns the balls to the burnishing chamber, ready for the next batch.

The barrel is 10-sided, has sides and charging end of 3-in. maple, and has a diameter greater than its length. It runs on chilled rollers, which rotate in Hyatt roller bearings. V-belt motor drive is provided.

Cut-Off Machine, Type D, "Radiac"

A. P. de Sanno & Son, 1615 McKean St., Philadelphia, Pa. [Vol.73,p.718.] 326.

Stock to 1 in. in diameter can be cut-off on the Type D machine, which has many of the mechanical features of the Type

C described on page 819, Vol. 72, but is considerably lighter in weight and requires less floor space.

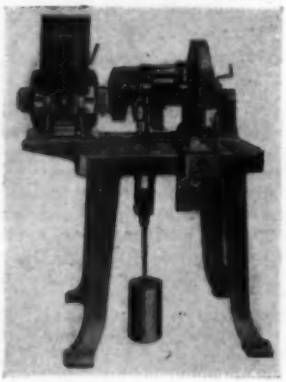
This machine uses a "Radiac" cut-off wheel 12x$\frac{3}{32}$x1 in., running at 15,700 surface ft. per min. with a spindle speed of 5,200 r.p.m. Material to be cut is held firmly in a clamp operated by a treadle so that the operator's hands are free. The Type D is limited to straight cuts.

Floor space, 30x25 in.; height, 44 in.; weight, 750 lb.; motor, 3 hp.

Cut-Off Machine, Abrasive

Andrew C. Campbell, Inc., Bridgeport, Conn. [Vol.73,p. 901.] 438.

This abrasive cut-off machine is suitable for cutting steel, steel alloys, iron, non-ferrous metals, fiber, and other materials. The work is held firmly in place by



a fixture. The handle for operating the abrasive disk is arranged so that the operator may use either hand in cutting the material. Belts and the disk are guarded to prevent danger of injury to the operator.

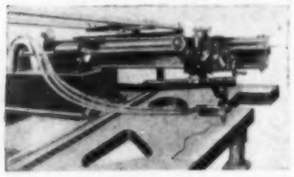
Cutting Machine, Shape, Oxyacetylene, "Messer"

Jos. C. Paulus & Co., 2507 Potter St., Philadelphia, Pa. [Vol.73,p.760.] 273.

Three sizes of the "Messer" automatic shape cutting machine have been introduced into the United States. These have

cutting widths of 39, 58, and 78 in. Lengthwise cuts are limited only by the length of the rails upon which the machine is supported.

The machine is designed as a combination compound trav-

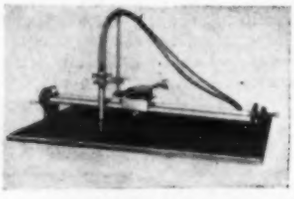


ersing-head and templet cutting machine, and is able to execute practically any form of cut. It contains an inclosed motor of ¼ hp., direct connected to a stepless friction drive that is capable of moving the burner at any desired speed to suit the thickness of the material being cut. Bevel cuts can be made at any angle to the surface of the steel.

Cutting Machine, Oxygen, Straight-Line, Type A, "Meco"

Modern Engineering Co., 3411 Pine Blvd., St. Louis, Mo. [Vol. 73,p.901.] 433.

A portable oxygen cutting machine designed especially for the average boiler and structural steel shop is being marketed. The machine consists primarily

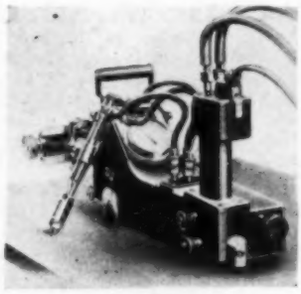


of a carriage having a cross-feed similar to the compound rest of an engine lathe. Longitudinal feed is 42 in. for the carriage. It is possible to make cuts at almost any desired angle as well as circular cuts with a radius within the range of the cross-feed movement, which is 7 in. The machine is intended for use with the Type O machine cutting torch made by the company. Weight, 80 lb.

Cutting Machine, Oxy-acetylene, Portable, "Messer"

Jos. C. Paulus & Co., 2507 Potter St., Philadelphia, Pa. [Vol.73,p.1018.] 461.

This portable oxy-acetylene cutting machine has a built-in universal motor of 1/60 hp. It can be equipped with a manometer for registering the gas pressure for different thicknesses of metal, and thus allows even an inexperienced operator to obtain an even travel and a clean, even cut. The mixing chamber is placed back of the



cutting nozzle to allow the gases to expand and unite before they are ignited. Cutting nozzles are made in two parts fastened separately into the cutting head, one inside the other, producing a round ring preheating flame, with the cutting oxygen passing through the center.

Filing Machine, Die, Rotary

Rehnberg-Jacobson Co., Rockford, Ill. [Vol.73,p.71.] 31.

Three-speed, V-belt drive, giving from 1,800 to 900 r.p.m. at the spindle, is employed on this rotary die filing machine.

The collet chuck will take up to ¾-in. file shanks.

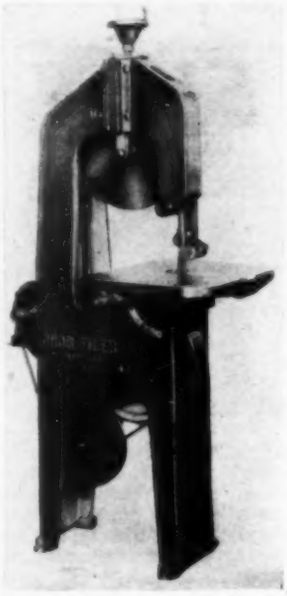
The 10x10-in. table is clamped on the column. It has an additional screw adjustment below the table. Maximum distance from the table to the spindle nose is 4½ in., and from the column to the spindle, 7 in. Table tilts with screw adjustment 10 deg. from horizontal. The machine stands approximately 32 in. high, and weighs about 345 lb. The bench space required is 12x20 in.

Filing Machine, Continuous, No. 1

Grob Brothers, 90th & National Aves., West Allis, Wis. [Vol.73,p.369.] 137.

Applications: Manufacture of dies, special tools, and miscellaneous parts requiring filing, both internal and external.

The 16x20-in. filing table tilts 22½ deg. either way. An indicator finger and a graduated plate provide means of setting the table angularly. The continuous file chain is made of a series of links operating on two sheaves. A heavy helical spring maintains the proper tension. Links to which the files are welded can be replaced by removing two pins. Either flat, half round, or specially formed filing chains can be used. The filing chain is driven by means of a Texrope reduction drive.



Chain speeds are 170, 195, and 225 ft. per min.

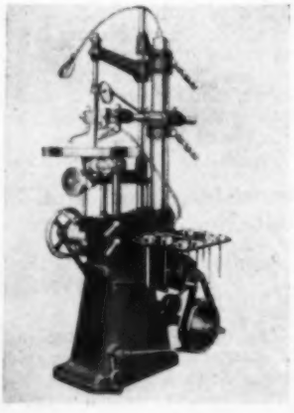
Over-all height, 61 in.; total weight uncrated, 400 lb., and floor space, 12x19 in.

Filing and Sawing Machine, Precision, "Rapid"

J. I. Bernitz, 47-49 West St., New York City. [Vol.73,p.412.] 168.

Punches, dies, gages, curved articles, templets, jigs, cams, forming, and drawing tools can be sawn out and filed with a clean finish on any of the four sizes of the machine. The table can be tilted to 15 deg. in four directions.

The tool bow has universal adjustment for long and short strokes. The workholder has vertical adjustment on the back column. When using light saw blades, a special type roller guide is fitted on the workholder arm. On the medium- and large-sized machines, a further roller guide is also arranged below the table.



Speed of these machines ranges from 60 to 425 strokes per minute. Stroke in each of the four sizes is adjustable from a minimum of ⅜ in. to a maximum of 6½ in., depending on the size of the machine. Table diameters range from 8⅜ in. to 19⅜ in., and the distance from the support to the center of the table varies from 4⅜ in. to 12 9/16 in.

Flexible-Shaft Machine with V-Disk Speed Changer

United States Electric Tool Co., Cincinnati, Ohio. [Vol.73, p.301.] 121.

Eight speeds from 1,000 to 11,000 r.p.m. are available on this flexible - shaft machine through the use of a V-disk speed changer. This unit also embodies a shaft and casing which are more flexible. The hand piece turns on ball bearings.

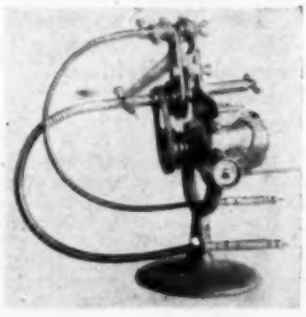
Models are available in sizes from ¼ to 3 hp., and in all styles

of mounting for overhead, vertical trolley, floor or stand, bench, or horizontal applications. The three classes are: Engraver's models, die sinkers or form-filing models, and heavy-duty models.

Flexible-Shaft Machines, Two-Shaft

Keller Mechanical Engineering Corporation, Brooklyn, N. Y. [Vol.73,p.1023.] 460.

Two shafts for low- and high-speed use respectively are embodied in this two-shaft, flexible-shaft machine. The first is for ordinary work employing tools with 1/16 to ¼ in. shanks running at speeds from 875 to 3,500 r.p.m. The second, which

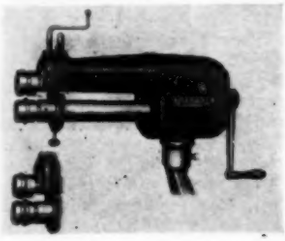


is the upper and lighter shaft, is for high-speed work with a speed range of from 5,250 to 10,500 r.p.m., and is suited for delicate work with small burs and grinding stones down to ¼ in. in diameter. The larger shaft may be left on the machine for coarser work. The small shaft may be also used on jack shaft pulley, so that small burs and rasps may be used at the slowest speed.

Beader, No. 192, "Niagara"

Niagara Machine & Tool Works, Buffalo, N. Y. [Vol. 73,p.336.] 115.

No. 18 gage sheets can be handled on the No. 192 beading machine. The throat is deep so that beads can be rolled at a considerable distance from the end of the tube. A steel horn carries the bronze bearings for



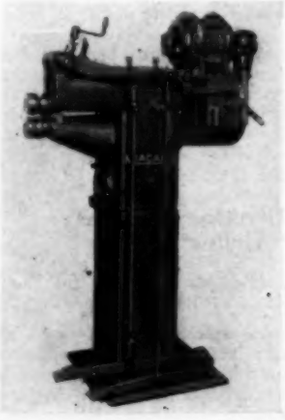
the lower shaft. A crankscrew raises and lowers the upper shaft to allow entrance of the piece.

Rolls are of case-hardened steel held in place with countersunk nuts. A large gage with a polished face slides on the lower horn. Equipment consists of one pair of 1-in. "Ogee" beading rolls, one pair of ⅜-in. beading rolls, a large standard, and a wrench.

Beader, No. 180

Niagara Machine & Tool Works, Buffalo, N. Y. [Vol. 73,p.684.] 313.

This machine is suitable for metal parts of all types and for general plant maintenance work. It has a maximum ca-



pacity of No. 14 gage mild steel, and is designed for the regular operations of turning, wiring, crimping, beading, slitting and flanging. Special rolls can be designed for unusual operations. Single pulley drive or belted motor drive through a self-adjusting, ball-bearing idler can be furnished. Motion of the rolls is controlled by a clutch.

Cleaning and Oiling Machine, Sheet-Metal

Gray Hub Co., Detroit, Mich. [Vol.73,p.949.] 445.

Machine wiping and lubricating of sheet, with consequent speeding up of production, can be effected by means of this sheet-metal cleaning and oiling

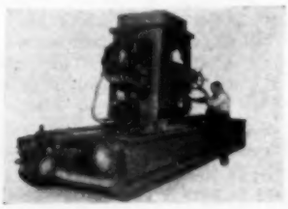
machine. It eliminates scratches before and after finish enameling or painting.

A standard 40-in. portable, motor-driven machine is illustrated. It consists of two brush rolls at the front and two felt rolls at the rear. Sheets are inserted between the brushes until seized by the felt rolls, which draw them through. Drawing compound can be placed on the sheets if required.

Chipping Machine, Billet

Bonnot Co., 722 Mulberry Road, S.E., Canton, Ohio. [Vol. 73,p.297.] 112.

Billets of any cross-section and any length up to 30 ft. can be handled without adjustment on this billet chipping machine. Six motions of the cutting head



are possible with one lever. One unskilled operator can complete the chipping of an average billet in about ½ hour.

The fixed base supports the movable main carriage and carriage travel mechanism, and the bed and chuck that holds the billet. An adjustable manipulator chuck operated by compressed air is provided on the base and billets can be turned through either 90 deg. or 45 deg. as desired.

Motion is transmitted to the carriage by a heavy bronze nut on the travel screw. Driving is effected by a 25-hp. motor. A transverse movement of 14 in. to the cutter head can be effected.

Die-Casting Machine, 12x16-In.

Madison-Kipp Corporation, Madison, Wis. [Vol.73,p.757.]

The rating of 12x16 in. is derived from the fact that the center distances between the four guide rods which carry the die carriage are 16 in. between the horizontal pairs of rods, and 12 in. between the vertical pairs. Stroke of the machine is 12 in. Stationary dies up to 4½ in. may be mounted on the hot plate.

All important bearings are bronze bushed and lubricated from a Madison-Kipp lubricator. Where multiple die cavities are operated at high speeds

on long runs, the dies may also be lubricated automatically.

Complete automatic control of the mechanism is another feature. Power is furnished by a 3-hp., four-speed, constant-torque motor. With the four motor speeds, provision is made for making 2.77, 4.16, 5.55, and 8.33 shots per minute.

Drum Manufacturing Machine, Automatic

Niagara Machine & Tool Works, 637 Northland Ave., Buffalo, N. Y. [Vol.73,p.987.]

Steel drum bodies of No. 16 gage, after having been rolled to cylindrical shape and welded, progress through the Niagara automatic drum manufacturing machine at the rate of five per minute. The bodies are flanged, the rolling bead expanded, the rolling bead rerolled, and corrugated. Drums are fed automatically and ejected when completed. One operator lifts the drum bodies to the feeding mechanism. This type of machine can be used separately or in combination of two, three, or four units.

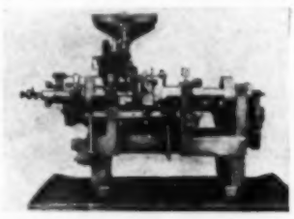
The machines work on both ends of the drum body at the same time. All motions, except the rotation of the rolls, are controlled by hydraulic cylinders. Individual motors operate the rolls.

Accessible adjustments are provided, for changing machines from one size body shell to another. Bodies from 9½ to 24 in. in diameter and 14 to 42 in. in length can be handled.

Forming and Drilling Machines, Second-Operation

H. P. Townsend Manufacturing Co., Hartford, Conn. [Vol. 73,p.1025.] 491.

The first machine, a combination drilling and forming type, is particularly suited for handling all kinds of previously formed blanks, operations of small tubes and shells, and secondary operations on screw machine products. It is capable of pointing, forming, shaving, drilling and hollow milling.



This machine is built in three sizes to handle work up to ½ in. diameter by 5 in. long. The largest drill carried is ¼ in.

The second machine is a double end drilling type set up for drilling cotter pin holes crosswise through clevis pins and bolt blanks. When they reach the center, one drill is withdrawn and the other continues on to finish the hole.

For cotter pin holes, work can be handled up to $\frac{7}{16}$ in. diameter by 3½ in. long. Work can be centered up to 1 in. diameter by 9 in. long.

Forming Machine, Roll, Model F

McKinney Tool & Mfg. Co., 1688 Arabella Road, Cleveland, Ohio. [Vol.73,p.946.] 440.

Moldings, tubing, and formed sheets can be produced on the Model F roll-forming machine at speeds from three to six times as fast as the best press speeds. These sections can be rolled from strip or sheet stock of

brass, copper, zinc, aluminum, steel, or stainless steel.

Type F machine is built on the unit plan. Each unit carries one pair of work spindles and is entirely self-contained. Each unit contains its individual speed

reducer. The motor is mounted at the base of the machine and is connected to the drive shaft by a multiple V-belt drive. Main housings are grooved to the bed and doweled in place. Front housings are not bolted to the bed, but each slides from front to rear on a guide strip doweled to the bed. This type of construction permits housings to be placed up against the work roll, regardless of whether a wide or narrow section is being rolled.

Rolling speeds of 100 to 150 ft. per min. are practical for most sections, but speeds as high as 650 ft. per min. have been obtained.

Hammer, Drop, 25,000-Lb.

Erie Foundry Co., Erie, Pa. [Vol.73,p.68.] 16.

Assembled, this hammer has a standing height of 35 ft. 6 in. The sow block measures 60 in. from front to back; die space in the clear between the guides 52 in., and the ram, 54 in. from front to back. This hammer

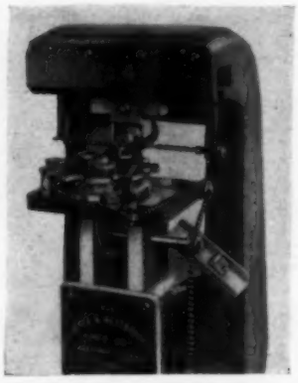
has a 32-in. cylinder with a piston rod of 11 in. in diameter.

This machine is being used for production of large die-forgings. Among the improvements are: Positive guide alignment; a V-type sow block; an extended box section frame; and the latest type of motion valve.

Marking Machine, Production-Type

Noble & Westbrook Manufacturing Co., 20 Westbrook St., East Hartford, Conn. [Vol.73, p.903.] 370.

An eight-station revolving table is employed on this special trade-mark embossing machine. A cylindrical die travels from right to left in a cycle required to do the marking or



embossing. The slide is operated by a motor mounted in the base, travel being effected through a rack and pinion. The die is controlled by a specially designed chain so that die travel is always in the embossing position. Pressure is applied by a pedal.

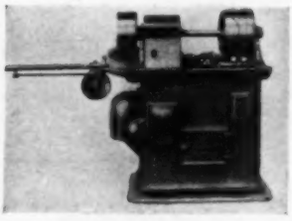
Weight, 400 lb.; floor space, 18x34 in.

Nut Machine, "Ekonomatic," Model 1

Potter & Johnston Machine Co., Pawtucket, R. I. [Vol.73, p.644.] 281.

This small-size nut machine, designed primarily for the manufacture of nuts ranging from ¼ to ½ in., is capable of performing a number of operations on the bar. The base of the machine is 3½ ft. long by 2 ft. wide. The main spindle will handle hexagon bars up to ⅞ in. across the flats for ½-in. hexagon nuts and 1-in. round stock.

The conventional form of feed stop is not used. Operation of the center tool bar and double-action swing arm, which carries the cutting-off and forming tools, are closely timed to synchronize their feeding movements. Mounted on the cam-

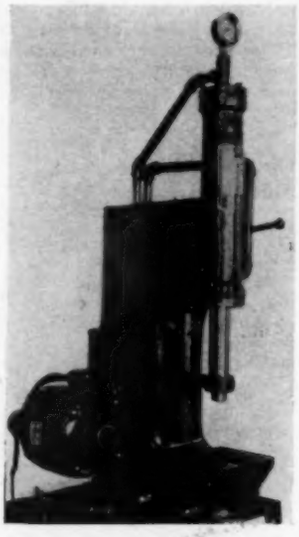


shaft, directly over the spindle, is a swing arm that carries cams for engaging and disengaging the draw-back collet. Instead of the conventional design of sliding spool, the fingers are compressed by an external collar.

Press, Arbor, Hydraulic, Bench

American Broach & Machine Co., Ann Arbor, Mich. [Vol. 73,p.948.] 402.

A small hydraulic arbor press that can be attached to a bench or lathe bed has been placed on the market. It is driven by a ½-hp. motor, drive being by means of a roller chain. The stroke is 12 in.; diameter of the ram, 2 in., and the speed of the ram, 60 ft. per min. The width

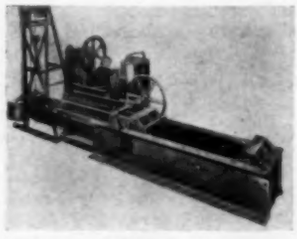


of the slot in the table is 2½ in., and the total height of the machine is 41 in. Maximum ram pressure is 1 ton.

Press, Metal-Scrap, No. 12PC

Galland-Henning Manufacturing Co., Milwaukee, Wis. [Vol. 73,p.942.] 444.

Mechanical baling of metal scrap is the function of the No. 12PC press. Loading space of the charging box measures 48 in. long, 16 in. wide, and 13 in. deep. Final size of the bales



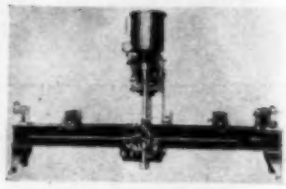
produced is 5x5x13 in., and the weight of a bale is approximately 40 lb. in copper. Capacity of the unit is about 750 to 1,250 lb. of scrap per hour.

A plunger drives the ram forward. The hydraulic cylinder is of forged steel.

Presses, Shaft-Straightening, "H-P-M"

The Hydraulic Press Manufacturing Co., Mount Gilead, Ohio. [Vol.73,p.415.] 175.

The ram unit is arranged so that it may be moved along the work-supporting bed. High production capacity is obtained from a "Fastraverse" oil-pressure system. The precision manual control provides means for governing both the direction



and speed of the ram travel. Motion of the ram during both the rapid advance and the slower pressing speed is controlled by the same lever.

Six standard sizes are available, the first four of which have capacities of 75, 100, 150, and 200 tons pressure, respectively. The last two heavy-duty sizes have pressure capacities of 300 and 400 tons.

Riveters, Assembly, Differential-Case and Crown Gear

Hanna Engineering Works, 1765 Elston Ave., Chicago, Ill. [Vol.73,p.452.] 176.

Because of the heavy pressure applied to form the rivet heads, the machines are arranged to drive two diametrically opposite rivets at the same time, to insure symmetrical clamping of the parts.

The first unit has provision for adjustments enabling the dies to be shifted over a con-

siderable range of distances between rivets. The second unit has the dies vertical, the work being carried upon a central pivot midway between the two dies. The third has dies horizontal. The work is supported upon a stud carried by an arm provided with adjustable stops, by which the work is positioned when the arm is swung over to the limiting point.

Riveting Hammer, "Airflex"

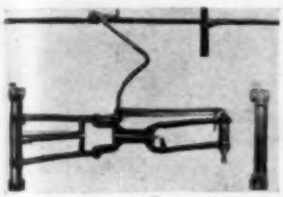
Walcott Machine Co., Jackson, Mich. [Vol.73,p.607.] 236.

A wide variety of operations can be undertaken, particularly on thin or fragile stock. Among these operations are riveting, calking, chiseling, slatting, peen-

ing, and assembly operations. An air rotor or an electric drill can be substituted for the air hammer.

The wall and pedestal models are available in three sizes to handle 3/32-in., 1/4-in., and 5/16-in. rivets. Air pressure required, 80 lb. per sq.in.

The patented holding device makes it possible to bring the tool to any point inside a half circle having a radius of 42 in.



Speed and power of the hammer are regulated by a patented throttle control valve adjustment.

Saw, Cut-Off, High-Speed, No. 00

Joseph T. Ryerson & Sons, Inc., 16th and Rockwell Sts., Chicago, Ill. [Vol.73,p.31.] 3.

The No. 00 high-speed cut-off saw is now the smallest machine of the line, and is suitable for cutting light-gage steel moldings and small shapes of non-ferrous material. Solid steel sections from 1/4 to 1/2 in. round or square can be cut.

The cutter is mounted on an arbor carried by two heavy, double-row self-aligning ball

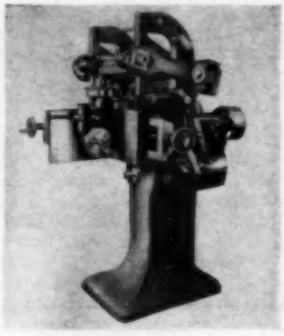
bearings and driven by a triple V-belt and 3-hp. motor. Adjustment up and down is provided for the table.

Shaper, Punch and Die, Vertical

J. I. Bernitz, 47-49 West St., New York, N. Y. [Vol.73,p.379.] 167.

Simplicity of the tools used and convenient scales and indexing devices make it possible to have punches and dies finished 70 to 90 per cent by unskilled labor.

Applications of the machine are: manufacture of punches, especially of odd shapes for cutting and stamping dies; slotting operations on dies, and grinding and finishing hardened punches with a special grinding motor.

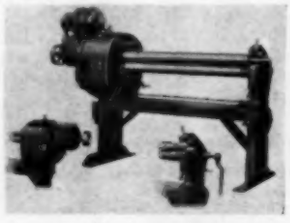


Horizontal travel of the table is 9 3/4 in., and the length of the stroke varies from 1 1/8 to 3 1/8 in. The maximum length and width of dies which can be slotted is 9 3/4 in., and the maximum thickness is 3 1/8 in. Floor space required, 40x51 in.; net weight, 1,350 lb.

Slip-Roll, 4-In.

Niagara Machine & Tool Works, 637 Northland Ave., Buffalo, N. Y. [Vol.73,p.178.]

This former is intended for forming sheet metal into cylindrical shapes. The top roll is pivoted at the left-hand end and swings forward to permit sliding the work off. Three lengths of rolls are available; namely,



36, 48, and 60 in., and they can be furnished for either hand operation, pulley drive, or belted motor drive.

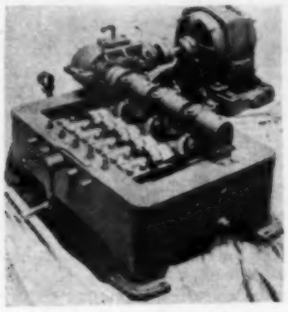
Three grooves of various widths are provided at the right-hand ends of the back and bottom rolls to permit forming work that has an outside wired edge.

Straightening Machine, Round, No. 000

Sutton Engineering Co., Park Bldg., Pittsburgh, Pa. [Vol.73, p.986.] 397.

Hot-rolled, cold-rolled, and cold-drawn bars, tubes, and pipes in both ferrous and non-ferrous metals can be straightened on the No. 000 round straightening machine.

Three driven rolls and five idlers are provided. Thus, two more straightening points are available, this being especially important when heat-treated materials are to be straightened. Capacity is from 1/4 to 1/2 in. O.D.



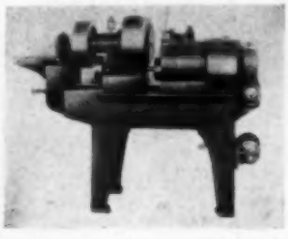
at a rate of 150 ft. per minute.

Floor space required 3 ft. 2 in. x 2 ft. 3 in., and weight, 1,040 lb.

Swaging Machine, Butt, Automatic

Langelier Manufacturing Co., Providence, R. I. [Vol.73,p. 227.] 27.

This automatic swaging machine can be adapted for any work requiring swaging between two butts. The machine takes the wire from the coil, straightens it, swages it, and cuts it off to the proper length. It consists of one of the company's standard No. 3 open-die swaging heads mounted on the end of a horizontal bed. The mechanism for drawing the wire



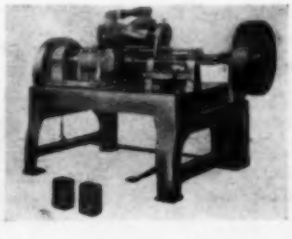
through the swaging dies and cutting it to uniform length is bolted on the other end.

Floor space, 26x70 in.; weight 2,000 lb.

Trimming Machine, Automatic, for Boxes

E. W. Bliss Co., 53d St. and 2d Ave., Brooklyn, N. Y. [Vol. 73,p.758.] 292.

Symmetrical boxes or containers made from brass or mild steel can be trimmed on this automatic machine. Stock up to 1/8 in. thick can be trimmed, and the machine will handle shells 20 in. across the corners and up to 6 in. in depth. The minimum size of shells handled is 4 1/2 in. wide by 1 in.



deep. The ratio between width and length of shell must not exceed 2 to 1.

This trimming machine is arranged with a Bliss positive rolling key clutch, and the gearing is such that the shaft actuating the trimming cam rotates once while the chuck spindle rotates one and one-half times. For this reason, it is necessary that the shells or boxes be symmetrical, as the starting point is the same every other time the shell is being trimmed.

One 7 1/2-hp., variable-speed motor provides power for the machine, which turns over at 20 to 40 r.p.m. and trims 5 to 10 shells per min.

Utility Machine, No. 2000, "Sioux"

Albertson Co., Sioux City, Iowa. [Vol.73,p.605.] 233.

Two chucks are provided on the No. 2000 "Sioux" utility machines. The 5-in. reamer drive chuck may be operated at 29, 46, and 69 r.p.m., the proper speed being selected by means of the gear shift. The 1/2-in. chuck is driven at motor speed and is suitable for buffing, polishing, and wire brush clean-

ing. A 7x2 1/2x1-in. hole grinding wheel is furnished. A braking arrangement stops the chucks and grinding wheel immediately when the switch is turned off.

Net weight, 170 lb.

Wire Stripper, "E-Z"

Ideal Commutator Dresser Co., Sycamore, Ill. [Vol.73,p. 833.] 376.

Rapid stripping of insulated wire from 12 gage to the finest magnet wire can be done on the "E-Z" wire stripper. An

open-side feed is employed so that the work is constantly in sight. The machine grips the wire automatically, strips it in the same manner, and works as fast as the operator can feed the wire. Stranded, solid core, and parallel cord are all stripped with a single pedal movement. End or center stripping on either single or duplex cord can be done.

The machine can be moved conveniently from place to place or mounted on a bench. Bench space required is 8x12 in.

Portable Tools

Drills and Electric Tools, Portable, "Hicycle"

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol.73,p.495.] 214.

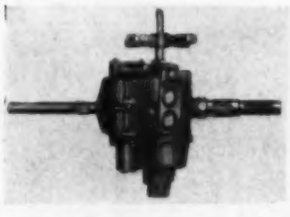
The Nos. 12 and 13 "Hicycle" drills are designed for drilling to ⅞ in., and are particularly suitable for automobile body trim departments. The No. 12 is not provided with an

extended grip handle, whereas the No. 12 is. The No. 12N screw driver is 10½ in. or under in over-all length and can be held comfortably in the palm of the hand. The No. 13N has an extended grip handle. The No. 12G die grinder has a 2 in. wheel for external grinding.

Drills, Portable, Pneumatic, No. 44

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol.73,p.454.] 203.

Both reversible and non-reversible types of the No. 44 "Little Giant" pneumatic drills are built. The long-stroke, 4-cyl., block-type motor contains the valves and pistons, thus permitting short ports and small opportunity for air leakage. A sensitive throttle assures ac-



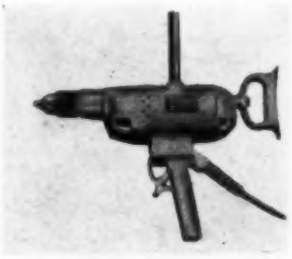
curate speed control. An automatic safety stop pin in the reversing throttle handle brings the drill to the "stop" or neutral position.

Drilling capacities of the various sizes range from 1¼ to 2¼ in., reaming capacities from 1 to 2 in., and tapping capacities from 1 to 2 in. The length of feed is 3½ in. in all cases. Weights, in malleable iron casings, 51 to 56 lb., aluminum alloy casings, 40 to 43 lb.

Drills, Portable

Wappat, Inc., Electric Tool Div. of Simonds Saw & Steel Co., 7522-26 Meade St., Pittsburgh, Pa. [Vol.73,p.641.] 270.

Universal motors are employed in these drills. All shafts are carried on precision ball bearings. Three-wire cable is used for safety, the third being a ground wire. An extra-capacity, double-pole, momentary-type switch insures the



tool against switch troubles. Streamline design is employed to obtain good balance.

Drill, Portable Type LO

Schauer Machine Co., Cincinnati, Ohio. [Vol.73,p.646.]

This tool measures only 10½ in. over-all and weighs 5½ lb. It embodies a special universal motor having the armature

shaft and the chuck shaft mounted on New Departure sealed-type ball bearings. Regular equipment includes a 3-jaw key chuck.

Drills and Reamers, Portable, Nos. A-257-3 and 267-3, "Hercules"

Buckeye Portable Tool Co., Dayton, Ohio. [Vol.73,p.719.]

This "Hercules" tool has light weight for its capacities, and is well fitted for close-

quarter work. In addition to being a drill and reamer, the tool can be used for setting nuts and driving staybolts. The tool comes in two speeds, 150 and 200 r.p.m., and is 9 in. over-all. Weight is 37 lb. and the feed, 2¼ in. It is equipped with a Hercules twist throttle and a No. 4 Morse taper socket.

Drills, Portable, Electric, 3/16-In.

The Stanley Electric Tool Co., New Britain, Conn. [Vol. 73,p.720.] 334.

Both tools are production types, weighing only 3¼ lb. and measuring 8¼ in. long. They are particularly adapted for working in close quarters.

The No. 361 has an aluminum

alloy housing, whereas the No. 361 B is made of a special insulating material. A universal motor is supplied, giving a chuck speed at no load of 3,000 r.p.m., and at full load of 2,000 r.p.m. The motor can be furnished for 32-, 110-, 220-, or 250-volt circuits. The handle can be put on quickly.

Drills and Screw Drivers, Electric, 3/16-In.

Black & Decker Manufacturing Co., Towson, Md. [Vol. 73,p.784.] 316-B.

The drill is equipped with a three-jaw, geared chuck of ⅞-in. capacity, and has a universal ball-bearing motor. It can be furnished for 110-, 220-, or 250-volt circuits.

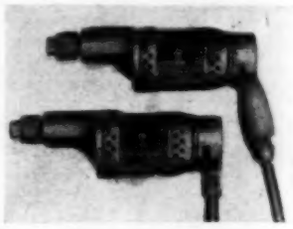
The screw driver is equipped with an adjustable friction clutch, which drives the screw flush and releases immediately without marring the screw head

or the surrounding surface. It can be adjusted for driving various types and sizes of small screws. A positive clutch engages the bit only when pressure is exerted.

Drills, Portable, Electric, Small, High-Frequency, "Thor"

Independent Pneumatic Tool Co., 600 West Jackson Blvd., Chicago, Ill. [Vol.73,p.830.] 386.

Two styles of small electric high-frequency (180 cycles) drills for close-quarter operations are being offered. Both styles are made in three speeds,



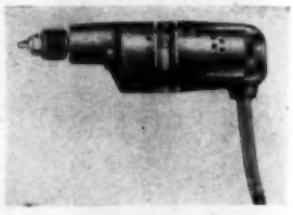
the bonnet style as follows: the AMC, illustrated, 2,300 r.p.m.; AMB, 2,790 r.p.m.; and AMA, 3,700 r.p.m. Capacity is ¼ in.; weight, 3 lb., and length over-all, 9½ in.

The grip switch style is made in the AMC, 2,300 r.p.m.; AMB, 2,790 r.p.m.; and AMA, 3,700. Capacity of this model is also ¼ in. Weight is 4 lb. 1 oz., length over-all, 9½ in.

Drills, Portable, Electric, Universal, Nos. 18 and 19, "Little Giant"

Chicago Pneumatic Tool Co., 6 E. 44th St., New York, N. Y. [Vol.73,p.908.] 412.

Capacity for drilling to ⅞ in. is found in the "Little Giant" Nos. 18 and 19 electric drills. Free speed of the 18A model is 4,300 r.p.m. and of the 18C



model, 2,800 r.p.m. Loaded speeds are 2,520 and 1,650 r.p.m. The No. 19 universal drill weighs about 4¾ lb. and is 9¾ in. in over-all length. It has a pistol-grip handle and a toggle switch in the rear.

Drill and Hammer, Electric

Wodack Electric Tool Corporation, 4627 West Huron St., Chicago, Ill. [Vol.73,p.1027.]

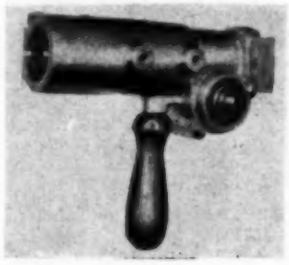
Drilling up to ½-in. holes in metal, ½-in. holes in wood, and ¾-in. holes in stone can be accomplished with the dual electric twist and hammer drill. It is also suitable for grinding, scratching, and buffing. The

tool itself weighs only 12 lb., and the entire kit 20 lb. Grinding, scratching, and buffing wheels, and a bench stand can be furnished.

Drive Attachment for Portable Drills, Right-Angle

Millers Falls Co., Millers Falls, Mass. [Vol.73,p.303.]

Boring, sawing, sanding, grinding, or polishing operations can be performed with the combination of the Millers Falls right-angle drive attachment with either the No. 514, ¼-in. heavy-duty, or the No. 516,



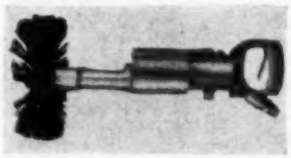
⅜-in., portable electric drills.

Three speed ratios—1½ to 1, 1 to 1, or 1 to 1½—are available. The first is adapted for sawing, the capacity being up to 1¾ in. It is also useful as a small disk sander or portable grinder.

Wire Brush and Grinder, No. 315-4, "Hercules"

The Buckeye Portable Tool Co., Dayton, Ohio. [Vol.73,p. 181.] 40.

Heavy-duty grinding, wire brushing, snagging, and buffing may be done with this tool. It can be furnished in speeds of



2,000, 3,100, and 4,000 r.p.m., and weighs 13 lb.

This "Hercules" air tool is built on the principle of the No. 300 series "Hercules" model.

Grinders, Portable

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.73,p. 340.] 145.

Two heavy-duty portable grinders having 1- and 2-hp. capacity, respectively, have been built with ball-bearing motors and a Timken roller bearing grinding spindle. The single-phase a.c. machines are equipped with improved, commutating-type, repulsion-induction motors.

Both sizes are available in standard models for 110 volts, single-phase; 220 volts, single-phase; and 220 volts, split-

phase. No-load speed of the 1-hp. model is 3,400 r.p.m.; 2-hp. model, 1,800 r.p.m. The wheel size of the 1-hp. grinder is 8x1½; 2-hp. grinder, 10x1½. The weight of the 1-hp. size is 85 lb.; 2-hp. size, 120 lb.

Grinders, Air, Ball-Bearing

Madison-Kipp Corporation, Madison, Wis. [Vol.73,p.722.]

The Model BBL is a low-pressure grinder, designed to develop 60,000 r.p.m. on 30 to 50 lb. per sq.in. air pressure. The Model BB also operates at 60,000 r.p.m., but requires from 50 to 100 lb. per sq.in. The Model BB-100 requires 100 to 120 lb. per sq.in., and operates at 100,000 r.p.m. Each of the

models is small enough to be held in the hand like a fountain pen for die-grinding operations. All models are equipped with ball bearings at both top and bottom of the spindle.

Chipper, Air, Kipp

Madison-Kipp Corporation, Madison, Wis. [Vol.73,p.912.]

Close control of the tool is the primary feature of the Kipp air chipper. It operates on air pressures of 60 to 100 lb. per sq.in. and delivers over 6,000 blows per min. Intensity of the blow is regulated by the pressure the operator exerts against the work and also by the position of the trigger valve.

The Kipp air chipper may be used effectively on tool and die work, metal and wood production work, and special riveting, chipping, and grooving operations.

The air chipper not only has a pistol grip, but also has a body or housing of pistol shape. Kipp pentagon-shaped chisels are inserted into the barrel and held by a spring clamp with any side up.

The air turbine is attached to the rotary valve, the rotary valve directing the air from one side of the hammer to the other automatically. The reciprocating action imparts pulsating energy to a floating striker shaft located at the forward end of the hammer cylinder.

Weight, 1½ lb.; length, 5⅝ in.

Sander, Belt, Electric

Skilsaw, Inc., 3814 Ravenswood Ave., Chicago, Ill. [Vol. 73,p.645.] 296.

Wood or metal can be surfaced with this electric belt-type sanding machine. Because of the traveling belt employed, surfacing without ripples is secured, and extra smooth finish

is attained through the use of a flexible pad.

Belt tension is controlled by a handwheel on the side of the machine. A thumbscrew adjustment provides alignment of the belt on the rollers. Helical gears afford silent operation. Ball bearings are employed throughout.

The belt size is 4½ in. wide x 26⅝ in. long, with a free speed of 1,700 ft. per min. Over-all size of the sander is 7x14x9 in. high. Net weight is 18 lb.

Sander, Pneumatic, Rotary, No. 260S, "Thor"

Independent Pneumatic Tool Co., 600 W. Jackson Blvd., Chicago, Ill. [Vol.73,p.647.]

This "Thor" sander is balanced to operate without vibration. When the sander is at peak load, the governor automatically opens the throttle and

admits as much air as is necessary to perform the job. When the motor is running idle, the governor automatically decreases the air consumption.

The speed is 4,500 r.p.m. Weight, less wheel or disk, 10 lb. Over-all length, 8 in.; and spindle thread, ⅝ in. x 11 U.S.S. threads per in.

Saw, Timber, Portable

Reed-Prentice Corporation, Worcester, Mass. [Vol.73,p. 532.] 222.

The saw illustrated is a gasoline-driven type and may be had with 16- and 24-in. capacities. The saw is made with a

swivel movement so that cutting can be performed either vertically or horizontally.

Cutting is performed by a chain traveling about the center frame, the links of this chain containing teeth. The weight of the 16-in. capacity saw is 82 lb.

Saw, Type K-9, "Speedmatic"

The Porter-Cable-Hutchinson Corporation, Syracuse, N. Y. [Vol.73,p.688.] 322.

Although similar in appearance to the Type K-8, the K-9 is of the gear-driven type. It is provided with a 1¼-hp. motor, and is geared to the drive arbor through hardened spiral gears having a reduction ratio of 2½ to 1. Saw speeds are 5,000 r.p.m. under average cutting load. With the latter speed it

is possible to rip a 3-in. plank 12 ft. long in 1 min.

The Type K-9 will cut to a maximum depth of 3¼ in. Both depth and angle adjustments are made easily. The former has a 1¾-in. travel and any angle up to 45 deg. can be secured, the scale being in 5-deg. graduations.

Weight, 23 lb.; over-all length, 12½ in.; width, 9¾ in.; and height, 11⅛ in.

"Multi-Tool"

J. G. Brill Co., Philadelphia, Pa. [Vol.73,p.640.] 280.

The hollow spindle is so constructed as to accept the square-ended shafts of various attach-

ments and tools. It holds them securely in place by a governor-controlled coupling. More than fifteen operations can be performed by the use of the one power unit.

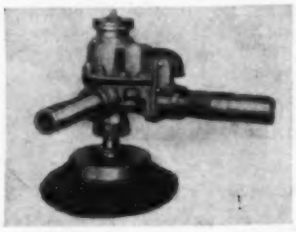
The outer shell is made of cast aluminum alloy. The standard ¼-in. tool is equipped

with a ⅛-hp. universal motor for either 110- or 220-volt circuits; four ball bearings; a center-spindle-type drive, and a pistol-grip handle. It is complete with a three-wire extension cord 10 ft. long and a two-piece plug. The tool weighs 7¼ lb.

Pneumatic Tools, Combination, Type "B-O"

Rotor Air Tool Co., 5704 Carnegie Ave., Cleveland, Ohio. [Vol.73,p.567.] 250.

Six standard combinations are available for Duco rubbing and polishing, wire brushing, finishing stone, rubbing filler and light sanding operations, nut setting, and drilling. With a cupped brush, this tool is used



for removing rust. Speeds of 2,000, 1,500, or 1,000 r.p.m. are available.

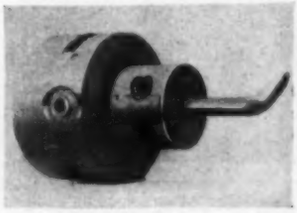
Small Tools

Boring Head, Offset, "Casler"

Westcott Chuck Co., Oneida, N. Y. [Vol.73,p.220.] 70.

Sole distribution of the Casler offset boring head, designed and manufactured by Herman Casler, Canastota, N. Y., has been taken over by the above concern. Three models are manufactured, of which the Style A is illustrated. It is designed to be threaded to the nose of the machine tool spindle, although it can be mounted on a taper shank.

The Style A is manufactured in five different sizes with drill chuck capacities of from ½ to



1½ in. The diameters of these boring bars range from 1 to 3 in., and the depths of holes bored range from 6 to 18 in., and diameters from 1 1/16 to 8½ in.

The Style C boring head will take drills from 7/16 to ⅝ in., the offset being ½ in. A straight shank is provided. Style F offset boring heads will take drills, reamers, or counterbores with shanks up to ¾ in. in diameter. An offset of ⅝ in. can be obtained with either round or hexagon tools up to 7/16 in. in diameter, while an offset of ½ in. is obtained with round or hexagon boring tools up to ¾ in. in diameter.

Boring Tool, Car-Wheel, Four-Cutter

Davis Boring Tool Co., 6200 Maple Ave., St. Louis, Mo. [Vol.73,p.685.] 320.

With four cutters instead of two, this car-wheel boring tool is capable of feeds from two to three times those formerly used on this work. When the micrometer screw is turned, the wedge is brought forward, expanding all the cutters equally. Cutters are furnished in high-speed steel, Stellite, and cobalt- or tungsten-carbide.

Center Finder, "Schwieterman"

Precision Gage & Tool Co., 320 East Third St., Dayton, Ohio. [Vol.73,p.685.] 264.

The "Schwieterman" center finder is now equipped with a specially arranged 1½-in. diam. Federal dial indicator. With some practice, work can be centered within 0.0002 in.

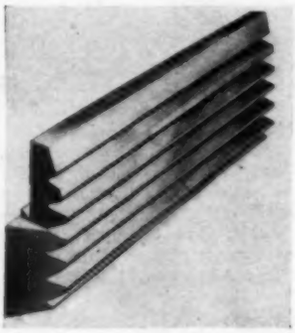
Three quickly interchangeable

feeler fingers are available. The No. 1 size is for holes up to ¾ in. in diameter; the No. 2 size, ¾ to 1½ in. in diameter and also for locating buttons, and the No. 3 size, holes from 1½ to 3 in.

Chasers, Ground-Thread

Landis Machine Co., Waynesboro, Pa. [Vol.73,p.1018.] 495.

Ground-thread chasers have been developed for use in all sizes of the Lanco and Landex heads and for the ½, ¾, 1¼, and



2-in. Landmatic heads. The ground thread form offers greater accuracy and also freer cutting action, which increases the life of the chasers between grindings.

Counterbore and Spot Facer, Interchangeable, Style B, "National-Cleveland"

National Tool Co., Madison Ave., at West 112th St., Cleveland, Ohio. [Vol.73,p.948.] 430.

Counterbores and spot facers, which are interchangeable on the same shank, have been placed on the market. The Style B tool employs a double-key drive,

one key on the cutter and the other key on the holder. Cutters are made of high-speed steel; pilots and holders of alloy steel, all hardened and ground. Cutters are available from ¾ to 5 in.

Cut-Off, Flaring, and Reseating Tools for Copper Tubing and Fittings

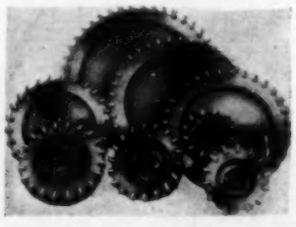
C. M. Smillie & Co., 520 East Larned St., Detroit, Mich. [Vol.73,p.796.] 336.

Three tools for cut-off, flaring, and reseating operations on copper tubing and fittings have been placed on the market. The C-1 tube cutter leaves the tubing round and without any burr on the outside. The burr cutter is for removing inside burrs before flaring the tube. The Type F-2 flaring tool is for flaring copper tubing from ⅛ in. to ⅝ in. O.D. The Type R-3 reseating tool can be used in a vise. Adapters for S.A.E. fittings from ¼ to ⅝ in. are held in the bottom of the tool by thumb screw.

Cutters, Face-Milling, Positive-Lock

Kearney & Trecker Corporation, Milwaukee, Wis. [Vol.73, p.643.] 287.

These cutters are not intended for heavy hogging purposes, but are primarily for medium roughing and finishing operations. The blades are so spaced as to make the cutters suitable for milling of surfaces made up of thin, narrow sections. Two styles are offered, one equipped



with high-speed steel blades, the other with Stellite blades. Cutters can also be equipped with blades tipped with cemented tungsten-carbide.

K & T cutters are made in fourteen sizes, ranging from 5 to 24 in. in diameter. The 5-, 6- and 7-in. cutters are for use with Style C, shell-end mill arbors; the 8-in. cutter is arranged to bolt on the spindle and can be centered by a centering plug; whereas the larger sizes are centered over the diameter of the spindle nose.

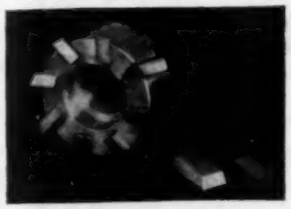
Cutters, Milling, Inserted-Serrated-Blade, "National-Cleveland"

National Tool Co., Cleveland, Ohio. [Vol.73,p.909.] 417.

Shell-end mills, face milling cutters, alternate tooth cutters, straddle mills, and other cutters of special design have been

placed on the market. Blades are of inserted, serrated type. Bodies are made from heat-treated alloy steel, hardened and ground. Cutters with Stellite or tungsten-carbide blades can be furnished.

Shell end mills range from 3 to 6 in. in diameter, with



general dimensions corresponding to the American Standard. Face milling cutters range from 6 to 20 in. in diameter to fit National Standard spindle noses. Alternate-tooth cutters range from 4 to 8 in. in diameter. Straddle milling cutters can be made from 4 to 8 in.

Diehead, Close-to-Shoulder, Special, Type "C"

Rickert-Shafer Co., Erie, Pa. [Vol.73,p.32.] 12.

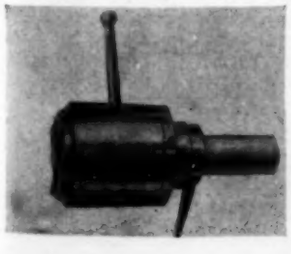
In general, the tool has the features of the original Model "C" described on p. 894, Vol. 72, of the *American Machinist*.

A special type is designed to cut two diameters simultaneously on the end of a crankshaft.

Diehead, Self-Opening, Type KL

The Geometric Tool Co., New Haven, Conn. [Vol.73,p.336.]

Adapted to short threads or threads of fine pitch, the Type KL is equipped with a lever trip. All stresses from tripping are removed from the chasers and from the threads being cut. The trip lever is so placed that it will contact with an adjustable stop. Cutters are interchangeable with other cutters of the company's manufacture.



Diehead, Tangent, Model 21

Jones & Lamson Machine Co., Springfield, Vt. [Vol.73, p.411.] 166

Chasers are held tangent to the work rather than radial and are ground in the threads. Dull and worn portions on the end may be removed by grinding on the end rather than on the chamfer. The dovetail on the back of the chaser is also ground, and ratchet teeth are cut on the tongue of the dove-

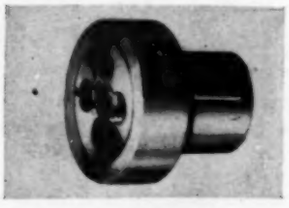
tail to engage a group of mating teeth in the chaser holder.

Chasers are sharpened and then measured in a gage which is furnished. A graduated micrometer screw tells exactly where the cutting edge will be when the chasers are in the die. Radial movement of the chaser holder is controlled by a cam ring.

Dieheads, Bolt, for No. 3 "Beaver" Die Stock

The Borden Co., Warren, Ohio. [Vol.73,p.496.] 208.

Bolt dieheads are now available for the No. 3 "Beaver" ratchet die stock, to thread bolts and rods from ¼ to 1 in., inclusive.

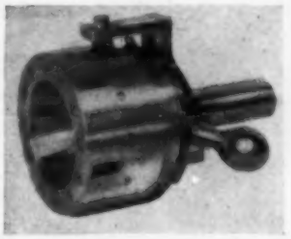


Diehead for Turret Lathes, Light-Duty, No. 10, Style D, "H & G"

Eastern Machine Screw Corporation, Truman and Barclay Sts., New Haven, Conn. [Vol. 73,p.646.] 263.

Cutting relatively fine pitch threads on large diameters is the feature of the No. 10, Style D, light-duty diehead, available for diameters from 2 to 3 in. with pitches not coarser than 10 and for lengths not over 2½ in.

The No. 10 diehead has six chasers in a set. Chaser cams are supported by the body and engage diagonal slots in the chasers to open them in a positive manner without individual springs. The diehead has a de-



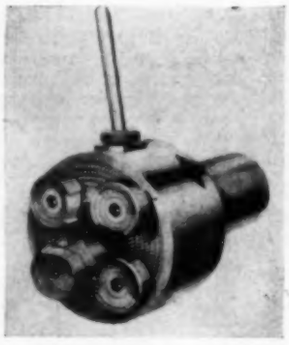
tachable shank, which can be supplied in various diameters.

The No. 10 diehead weighs 21 lb., as compared with 40 lb. for a regular 3-in. diehead. The outside diameter is 5¾ in., and the over-all length, not including the shank, is 4 7/16 in.

Diehead, Stationary, with Circular Chasers, Style DS, "Namco"

The National Acme Co., 170 East 131st St., Cleveland, Ohio. [Vol.73,p.761.] 343.

For use on screw machines, turret lathes, and other machines with non-rotating dieholders, the Style DS diehead embodies all of the features of the Style "DR" announced on p. 782, Vol. 72. It is supplementary to this model, which is



for use on machines with revolving spindles; also has quick removable circular chasers that permit long runs between grinds. They are mounted on "quick removable" chaser blocks, the faces of which are ground to the exact helix angle of the thread. The Styles DS and DR chaser blocks and chasers are interchangeable.

Close-to-shoulder threading is made safe by the positive action of the die in opening. There are only four major parts—cup, body, adjusting plate, and shank. The Style DS diehead is built in ½-, ⅝-, ¾-, 1-, 1¼-, 2½-, and 3¼-in. sizes.

Die Stocks, Three-Way, Nos. 33 and 34

The Borden Co., Warren, Ohio. [Vol.73,p.495.] 213.

Two three-way die stocks, the No. 33 with dies for ⅛, ¼, ⅜ in., and the No. 34 with dies for ¼-, ⅜-, and 1-in. pipe, are avail-

able. These die stocks are companion tools of the No. 3 "Beaver Jr." ratchet, the dies and caps being interchangeable.

Grinding Disks, "Red Anchor"

Covel-Hanchett Co., Big Rapids, Mich. [Vol.73,p.226.]

The grinding disk is a separate unit provided with anchor nuts molded into one side and accurately spaced to match drilled holes for the steel disk

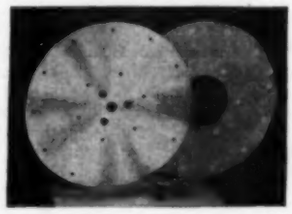


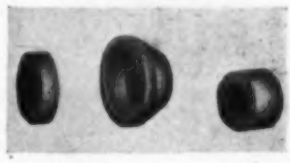
plate. The grinding disk is attached to the steel disk plate by standard ⅜-in. capscrews.

Three different bonds can be obtained with the "Red Anchor" disks, such as Bakelite, silicate, and vitrified (special). The regular machined disk plate may be drilled to receive these disks.

Grinding Wheels and Points, "Carborundum" and "Aloxite"

Carborundum Co., Niagara Falls, N. Y. [Vol.73,p.377.]

Wheels and mounted abrasive points for several types of portable grinders are now being manufactured in a wide variety



of shapes and sizes. They are made both in Carborundum Brand silicon carbide and Aloxite Brand aluminum oxide.

Hacksaw Blade, "Semi Flex"

L. S. Starrett Co., Athol, Mass. [Vol.73,p.981.] 468.

Easy and rapid cutting of pipe, tubing, wire, cable, electrical conduit, BX cable, and soft or thin materials is afforded by the "Semi Flex" hacksaw blade. It is made of tungsten steel.

Hammer, Copper-Bronze

Bunting Brass & Bronze Co., 738 Spencer St., Toledo, Ohio. [Vol.73,p.412.] 165.

This hammer utilizes an alloy that combines the necessary softness with a greater durability and a more satisfactory

performance in use than the conventional copper mallet. The hammer is stocked in 1- and 2-lb. sizes.

Hammer, Lead

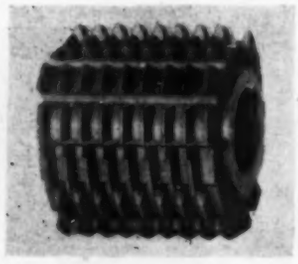
Bunting Brass & Bronze Co., 738 Spencer St., Toledo, Ohio. [Vol.73,p.834.]

For use where steel or iron machinists' hammers may not be used safely, a 2½-lb. lead hammer has been developed. The hammer head is securely assembled to a 10-in. steel handle. It supplements the line of copper-bronze hammers.

Hob, High-Production

Barber-Colman Co., Rockford, Ill. [Vol.73,p.263.] 103.

Wider tips on the teeth are featured on this high-production hob. This deliberate distortion permits more metal at the point of greatest cutting effort. The leading side has less clearance than usual and the leaving side more, thus producing a more uniform cutting action on both



the leading and leaving sides.

Straight gashes are used, producing teeth having faces at an angle with the line of the lead helix, thus giving a shearing effect on the leading edge and top of each tooth. In addition, the teeth are sharpened with a considerable hook instead of the customary radial face.

Holder, Toolbit, "Four-Grip"

Four-Grip Tool Co., 107 East 17th St., Paterson, N. J. [Vol. 73,p.945.] 452.

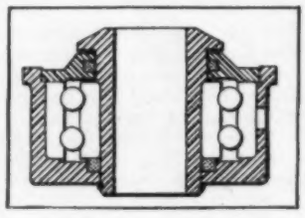
No shifting of the bit during cutting and minimized bit breakage are features of the "Four-Grip" tool bit holder. The

"Mac-It" setscrew forces in a V-block against one edge of the bit and holds it rigidly in its seat. The size of the No. 4 holder is ⅝ x 1⅝ x 7½ in. long. It takes a bit ⅜ in. square and weighs 2¼ lb.

Jig-Bushing, Rotating

National Boring Tool Co., Detroit, Mich. [Vol.73,p.1017.] 490.

This rotating jig-bushing can be employed with boring-bars utilizing tungsten-carbide, and because of the close fit prevents vibration. It is claimed that

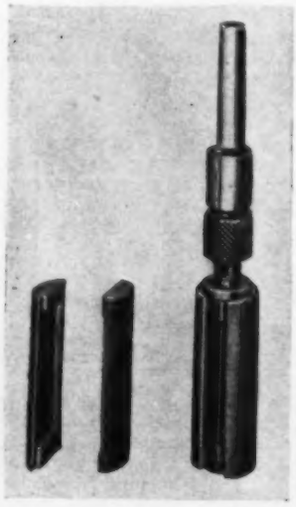


the "push-fit" is just right for such tools, since no rotation takes place except in the thrust ball bearing. This bushing is also of use in line-reaming fixtures and as a bushing in core-drilling jigs.

Lap, Toolroom, Series 200

Brickner-Kropf Machine Co., Muskegon, Mich. [Vol.73,p. 535.] 197.

This lap in sizes from ⅜ to 1 in. makes use of two inserts die-cast from a medium hard alloy that will take the charge of lapping compound readily. Six inserts cover the range. Lapping may be carried out at



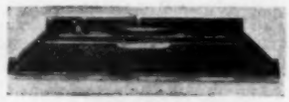
speeds up to 175 ft. per min. Lapping to the bottom of a blind hole can be effected.

The Series 200 lap is supplied with a floating driver and a straight shank ⅞ in. in diameter as standard.

Level, Master, Precision, No. 199

The L. S. Starrett Co., Athol, Mass. [Vol.73,p.607.] 239.

A level for set-up men and manufacturers of machinery has been developed. The main ground and graduated vial of 10 seconds accuracy has divi-



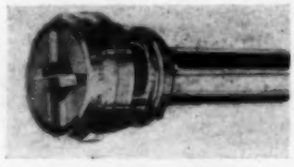
sions equalling ½ thousandth of an in. per ft. An auxiliary level is provided to show position laterally. A special alloy iron is employed to obtain freedom from thermal effects. The length of the device is 15 in.; height, 3 in.; width, 1½ in.; and the weight, 5½ lb.

Mill, Hollow, Inserted-Blade

Gairing Tool Co., Detroit, Mich. [Vol.73,p.981.] 481.

This tool is made for machining bar stock, castings, and forgings. By rotating the cone-shaped, graduated, external nut, blade adjustment is obtained. The blades have a positive lock and are of such construction that tilting is eliminated on heavy-duty work.

The tool is applicable to



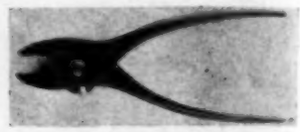
straight or taper surfaces and facing operations. The body of the mill can be made for multiple cuts or equipped with drills, reamers, or multiple-operation cutters. Pilots can also be inserted in the mill for facing and spot-facing operations.

This hollow mill is made in eight sizes for diameters from ½ to 2 in. Morse taper or straight shanks are optional.

Pliers, 7½ In.

Leo Manufacturing Co., Danville, Ill. [Vol.73,p.645.] 303.

A single size of pliers, 7½ in., is being manufactured. These pliers are nickel-plated and have a claw on the side to pull staples and cotter keys. They are of heat-treated alloy steel.

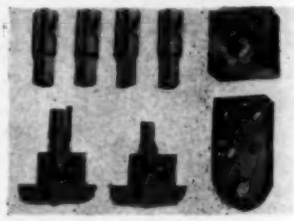


Punches and Retainers, Interchangeable, "Hercules"

Whitman & Barnes, Inc., Detroit, Mich. [Vol.73,p.369.] 161.

It is not necessary to remove the die from the press to change punches. Other advantages are lower die building costs; easier and quicker set-up; reduced "down-time" for die repairs, elimination of time lost through broken punches; lowered die maintenance costs, and stabilized and increased production.

The system consists of a removable punch held in a retainer by a detent acting in an arcuate recess in the shank of



the punch. The punch is released instantly when the detent is pushed upward out of the recess by an extractor pin working through the retainer block. The detent, in addition to supporting the punch, also, takes out longitudinal movement.

Punch retainers are made in square and rectangular types. Punches are stocked in common-use sizes in round, oblong, square, and hexagonal piercing points. Vanadium steel is used for the punches and carburizing steel for the retainers. Retainers mount on standard die sets, and the punches are aligned with regular die buttons.

Reamers and Milling Cutters, Tungsten-Carbide, "Castite"

Arthur A. Crafts & Co., 125 Summer St., Boston, Mass. [Vol.73,p.531.] 191.

Strauss Metal (tungsten-carbide) tips are brazed to blades of Seminole tool steel and set in special alloy bodies to form these reamers and milling cutters. The special alloy employed for "Castite" settings absorbs heat drawn from the cutting edges. Differential spacing of the blades in the solid reamer

prevents chattering. Extension of blades beyond the body permits facing the bottom of a hole and reaming it to size at the same time.

Saw, Metal-Cutting, Inserted-Blade

Henry Disston & Sons, Inc., Tacony, Philadelphia, Pa. [Vol. 73,p.983.] 482.

An inserted-tooth, circular, metal-cutting saw, known as the "Improved Interlocked," has been announced. This saw

makes a draw cut instead of a thrust cut. This principle results in easier, smoother, and faster cutting.

Scribers, Tungsten-Carbide-Tipped

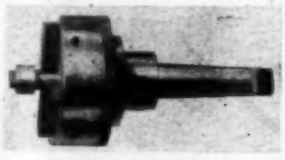
McIntyre & Kerr, 1741 Eighth St., Berkeley, Calif. [Vol.73,p.495.] 107.

Two sizes of tungsten-carbide-tipped scribers for toolmakers' and machinists' use, respectively, have been placed on the market. The tip is claimed not to come loose.

Spot-Facing Tool, Compound

Mummert-Dixon Co., Hanover, Pa. [Vol.73,p.262.] 106.

This compound spot-facing tool consists of a removable pilot stem, roughing cutters, and finishing cutters. The roughing cutters have serrated or saw-



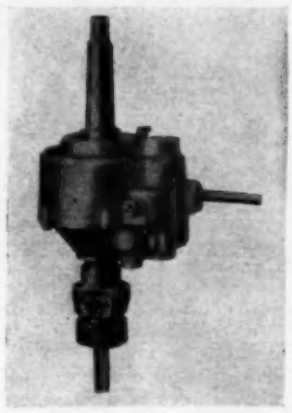
tooth cutting edges, and are movably arranged in the head.

Any size thimble may be placed on the pilot stem. An auxiliary pilot post can be used when the hole is too large for the regular pilot. Heads are furnished with standard Morse taper shanks, from 2½ to 6 in.

Tapping Attachment, No. 5, "Ettco"

Ettco Tool Co., Inc., 594 Johnson Ave., Brooklyn, N. Y. [Vol.73,p.69.] 26.

A large-size sensitive tapping attachment, which has a capacity up to ¾ in. in steel and 1 in.



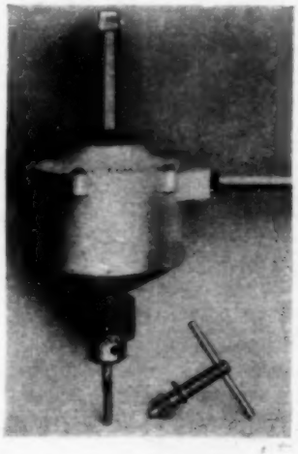
in cast-iron, has been developed. This tapper uses a multiple-disk clutch for driving the tap in and a ball-type positive clutch for reversing the tap at a ratio of 1.7 to 1.

A feature is the use of a single ball bearing to hold the case of the tapper in place. This bearing allows the case to have an angular floating movement.

Tapping Attachment

Procunier Safety Chuck Co., 18 South Clinton St., Chicago, Ill. [Vol.73,p.830.] 388.

High-speed sensitive tapping up to ½ in. in cast iron can be done with this small tapping attachment. It features a "Double



Cone" cork clutch, to give friction drive and friction reverse. Two ball-thrust bearings are employed.

Turning and Forming Tools, Tungsten-Carbide

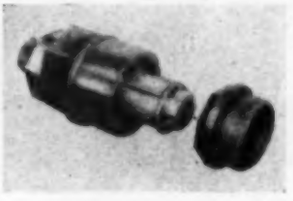
Arthur A. Crafts & Co., 125 Summer St., Boston, Mass. [Vol.73,p.988.] 474.

Strauss Metal (tungsten-carbide) is employed for the tips on tool bits and forming tools now manufactured by the above concern. These tools are made by the "Castite" process of brazing. Seminole steel is used for shanks, and the tools are diamond lapped.

Valve Seat Tool

Foster-Johnson Reamer Co., Elkhart, Ind. [Vol.73,p.72.] 21.

A tool for removing air compressor valve seats without chipping or burning them has been placed on the market. It will also replace the bushing



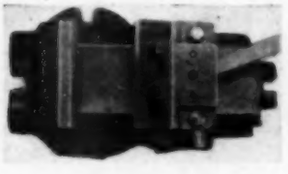
tight without distorting the valve seat. The tool incorporates a socket wrench locked firmly in place on top of the bushing.

Vise, Production

Wedge-Lock Tool Co., 2523 North Keeler Ave., Chicago, Ill. [Vol.73,p.908.] 398.

Loading and unloading time is reduced to a minimum, since the locking lever requires only a 15-deg. pull to engage the work, and then 7 deg. more to lock it securely.

The production vise can be



adjusted to various-size parts by loosening two screws. Maximum opening of the vise is equal to the width of the jaws. At present the vise is manufactured in four sizes having 4-, 5-, 6- and 7-in. jaws, the depths being 1$\frac{5}{16}$, 1$\frac{5}{8}$, 2$\frac{1}{4}$, and 2$\frac{5}{8}$ in.

Vises, Toggle

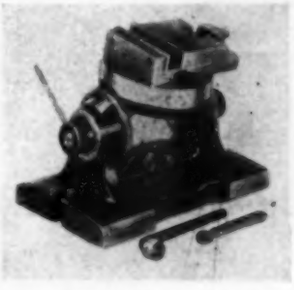
The Lindner Manufacturing Co., Wyoming Ave., Lockland, Ohio. [Vol.73,p.987.] 456.

This toggle vise is being manufactured in sizes from 4 in. wide to 20 in. wide for planer use, the jaw heights ranging from 3½ to 6 in. Standard sizes for general use are 4x3 in., 6x3½ in., and 8x4 in.

Vise, Plate, Angle, Universal

Spencer-Turnbull Co., 278 Main St., Hartford, Conn. [Vol.73,p.1022.] 494.

The "Connecticut" universal angle vise plate described on p. 448, Vol. 69, is now known as the "Spencer-Turnbull" universal angle vise plate, and is manufactured in four sizes. Dimensions are as follows: No.



1, base 2$\frac{3}{4}$ in. x 4½ in., table 2 in. diameter, height 2$\frac{3}{4}$ in.; No. 2, base 4½ x 7½ in., table 3½ in. diameter x 4½ in. high; No. 3, base 6½ in. x 9 in., table 4½ in. diameter, and No. 4, base 6$\frac{3}{4}$ in. x 12 in., table diameter, 6 in. T-slots in the four sizes are $\frac{5}{16}$, ½, $\frac{5}{16}$ and $\frac{3}{4}$ in.

Wrench, Pipe, "Walco"

Walworth Co., 60 East 42d St., New York, N. Y. [Vol. 73,p.217.] 7.

The tool has a forged one-piece bar and frame and consists of only four parts, which are the bar, jaw, nut, and spring. The jaw and the jaw housing are drop-forged from high-carbon tool steel. The alloy steel spring provides double action of the jaw; that is the jaw can rock and also

move laterally in the jaw opening.

The wrench is made in 6- to 48-in. sizes to take pipe from ¼ to 6 in. in diameter.

Wrenches, Socket, for Locomotive Washout Plugs

Stephen Walden, Inc., Worcester, Mass. [Vol.73,p.265.] 92.

The No. 45 set consists of three heavy-duty, double-square, chrome-alloy-steel sockets, 1¼, 1½, and 2 in., to fit the plugs in

common use, together with a combination connector and sliding-bar T-handle. The double-square broached sockets give a new hold on the plug for every 45-deg. turn.

Wrenches, Socket, Detachable

J. H. Williams & Co., Buffalo, N. Y. [Vol.73,p.800.] 367.

Complete equipment for a variety of industrial work is available in this line of detachable socket wrenches. Standard pattern socket wrenches have ½-in. square drivers and include sockets with double-hex, hex, and square openings up to 1 in. The heavy-duty pattern employs a ¾-in. square driver and the sockets have double-hex openings from ⅞ to 1⅛ in. The extra-heavy-duty pattern is provided with a 1-in. hex drive and sockets with double-hex openings from 1⅛ to 2⅛ in. Alloy-steel socket walls are thin and consequently operate in cramped quarters.

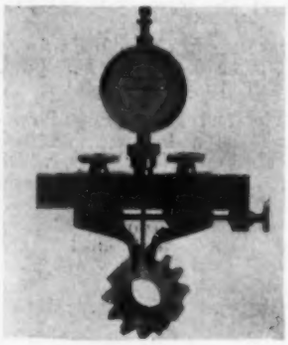
Five boxed sets comprising socket drivers and attachments are available.

Gaging, Measuring, and Testing Equipment

Comparator, Gear-Tooth, Sykes, Model E

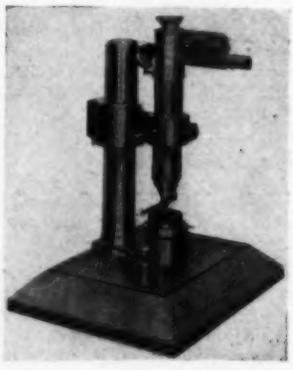
Farrel-Birmingham Co., Inc., 344 Vulcan St., Buffalo, N. Y. [Vol.73,p.70.] 23.

This gear-tooth comparator uses the chordal method and eliminates the necessity of having to use an instrument with



two scales. The instrument is a development of the Skyes gear-tooth vernier caliper.

Both jaws of the instrument are movable, but the dial indicator spindle is stationary. In addition, the dial gage is adjustable in the holder. Consequently, it is not necessary to change the plunger or spindle of the dial gage for gaging fine and coarse pitch gears.



inch has been announced. This device is mechanical and positive in its measurements and may be readily used by an inexperienced operator.

The instrument employs an adjustable, corrugated anvil to support the work. A vertical plunger carrying an extremely hard contact point is raised and lowered by a slight pressure on the operating lever. Motion of this point is transmitted to a pointer viewed through a microscope. This comparator is claimed to be suited to checking the size and parallelism of flat surfaces such as those of shop gage blocks.

The concern is also offering sets of size blocks.

Comparator and Gage Blocks

Millimicro Instrument & Gage Co., 20 West 22nd St., New York. [Vol.73,p.901.]

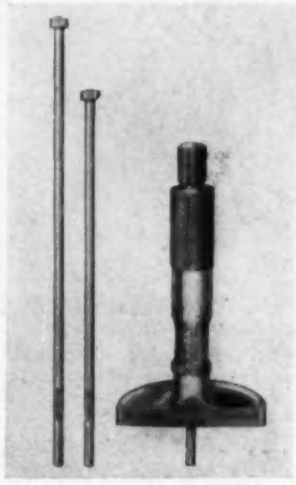
A precision measuring instrument claimed to be accurate within half a millionth of an

Gage, Depth, Micrometer, No. 312

The Lufkin Rule Co., Saginaw, Mich. [Vol.73,p.947.] 439.

This No. 312 gage has a half-round base, 2 in. in diameter, and rods ⅜ in. in diameter, adapting the gage for use in small holes. The balance of the tool permits it to be placed to the edge of the work.

Measuring capacity of the tool is from 0 to 3 in., by thou-

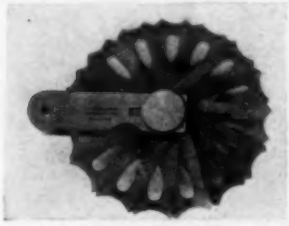


sandths. This range is obtained with three interchangeable rods. A 1-in. movement of the screw is provided.

Gages, Fillet and Radius, No. 627

Brown & Sharpe Manufacturing Co., Providence, R. I. [Vol.73,p.376.] 153.

Four sizes of fillet and radius gages are being produced. Blades are of hard-rolled steel and can be clamped securely. They are approximately twice the usual length. Concave and



convex radii of the same size are on the same blade.

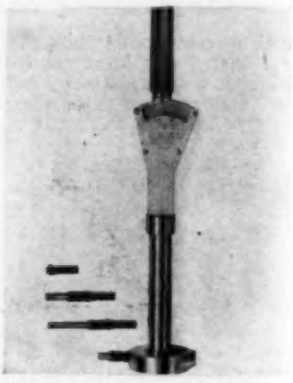
Gages are made in two styles. The Nos. 627A and 627B have a blade form for checking fillets and radii in corners or against shoulders. No. 627C and 627D are useful in laying out forming tools as well as for gaging fillets and radii. Nos. 627A and 627B have eight blades, 627A having a radii from 1/32 to 1/4 in. by 64ths, and No. 627B from 3/32 to 33/64 in. by 64ths. The No. 627C has 15 blades covering radii from 1/32 to ¼ in. by 64ths. The No. 627D has 16 blades covering radii from 1/64 to ½ in. by 64ths.

Gage, Inside, Indicator

Swedish Gage Co., of America, Detroit, Mich. [Vol.73,p.376.] 152.

This inside indicator gage, for accurately checking the diameter, taper, and out-of-roundness of deep holes, is made in two sizes, No. 3L and No. 5L. The No. 5L (illustrated) was developed primarily for checking cylinder bores in original manufacture and in regrinding operations.

The indicator scale is graduated in thousandths and ten-thousandths. Variations in diameter of 0.00005 in. can be



detected. Gaging anvils are hardened, ground, and lapped. Anvils tipped with diamonds or tungsten carbide can be had.

Gages, Internal and External, "Microtast"

Coats Machine Tool Co., Inc., 110-112 W. 40th St., New York, N. Y. [Vol.73,p.378.] 133.

These gages have the gaging contact end between two fixed points of abutment. What would otherwise constitute the gaging end is directly opposite the gaging point under spring pressure. The spring-operated yoke with two corner supports insures centralized position along the bore. The measuring contact point is located between these corner supporting points, while the interchangeable extension leg is inserted opposite the measuring contact point. The full diameter, not a shorter chord, is measured. The measuring contact point of the larger gages with the centering support is tipped with a Krupp special wearproof alloy.

Adjustable gages may be obtained with capacities from

0.787 to 14.173 in., in six sizes. These gages without the extension rod will gage depths from 2 to 5½ in. Extension rods are available in lengths from 2 to 11½ in.

Gage, Plug, Adjustable

John Bath & Co., 18 Grafton St., Worcester, Mass. [Vol.73, p.341.] 136.

A variation of the Bath internal micrometer—an adjustable plug gage, is now being produced. The gage is to be substituted for solid plugs where it is not necessary to take a

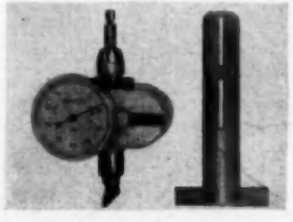
reading on every size but simply to secure long service life.

The feature of the gage is an adjustment for wear by means of movable jaws and a screw in the handle. A lap is provided with each gage to restore parallelism to worm jaws. This gage can also be made in the "progressive type" with both go and not go diameters on a single set of jaws. It is made in sizes from 1 in. to 4 in.

Gage, Rod, Amplifying

Comtor Co., Waltham, Mass. [Vol.73,p.370.] 146.

In this amplifying rod gage, continuous dial reading has been substituted for the try-and-try process with the micrometer. The flat crosshead on the lower gage contact keeps the gage in the transverse plane, or square with the bore



being measured. The other end of the gage is moved circumferentially for the highest reading, which is the correct diameter of the bore. The suspension bar may be used when the bore is in a vertical position.

One suspension bar serves for all diameters, and may be slotted at different depths.

Gage, Snap, Verifier, Mikrotast

Coats Machine Tool Co., Inc., 110-112 W. 40th St., New York, N. Y. [Vol.73,p.374.] 163.

This Mikrotast snap gage verifier has capacity from 0.275 in. to 7.875 in. Accuracy is

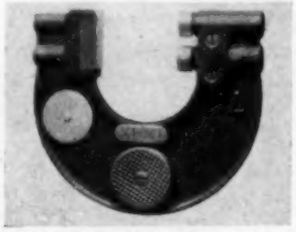
guaranteed to within plus or minus 0.00002 in. It may be used for testing or checking snap gages, as shown, and also for plain ring and ring thread gages.

Gage, Snap, Adjustable-Limit

Swedish Gage Co. of America, Detroit, Mich. [Vol.73,p. 183.] 58.

The gage is equipped with an aluminum disk for marking working limits and with an insulated grip of pressed steel, knurled and concave.

One end of the frame has a

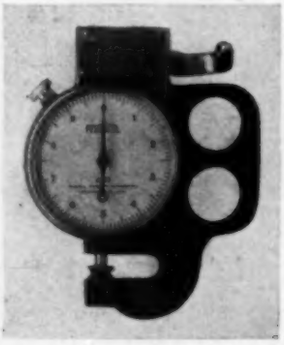


solid, non-adjustable, flat, tool-steel anvil, lapped parallel with the two adjustable tool-steel gaging plugs on the opposite end. Plugs and anvil are beveled to aid the operator in sliding the gage onto the work. The gaging plugs are not threaded.

Gage, Thickness, Dial, Model 390

Federal Products Corporation, Providence, R. I. [Vol.73,p. 608.] 259.

Flat stock can be measured with the Model 390 dial thickness gage, which is graduated



in ten-thousandths, the range being 0.100 in. A throat depth of ¾ in. is provided, and the flat or ball-pointed anvils are hardened and ground.

Gage, Dial, for Thin Material

B. C. Ames Co., Waltham Mass. [Vol.73,p.266.] 101.

Rapid and accurate measurement of thin materials can be effected by the dial gage illustrated. The dial reads to

0.000025 in. Any size of contact points can be furnished. The gage is finished in black crystalline lacquer.

Gage, Wire, Dial-Type, Model 341

Federal Products Corporation, Providence, R. I. [Vol.73,p. 225.] 64.

For measuring all kinds of small wire to tolerances of 0.0001 in., a Model 341 dial-type wire gage is supplied in a

bench-type mounting. It has a lever arrangement that can be operated by foot or hand control. The indicator can be swiveled on the bracket to keep it in direct vision of the operator at all times. The small metal piece on the back of the anvils is a guide for the wire.

Gage, Fine-Wire, "Krupp Mikrotast"

Coats Machine Tool Co., 110-112 W. 40th St., New York, N. Y. [Vol.73,p.532.] 221.

For gaging fine wire up to ⅛ in., the Krupp Mikrotast fine wire gage is set by raising the lower contact anvil until the

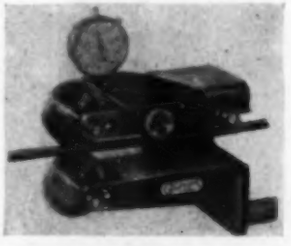
gap corresponds approximately to the diameter of the master wire. The indicating pointer is centered. Red tolerance markers are adjusted right and left of this setting. For gaging thin sheets, the back-stop shown may be removed altogether.

The fan-shaped Mikrotast indicator is furnished in 40 divisions of 0.00005 in. or 50 divisions of 0.0001 in., 0.0002 in., 0.0005 in., and 0.001 in.

Gage for Wire and Metal Ribbon, Model WF, "Comtorgage"

Comtor Co., Waltham, Mass. [Vol.73,p.797.] 375.

Small resistance wire or metal ribbon can be measured to ten-thousandths on the Model WF "Comtorgage." The design employs flat-faced rolls.



Gage, Steel-Ball, Portable, "Mikrotast"

Coats Machine Tool Co., Inc., 110-112 West 40th St., New York, N. Y. [Vol.73,p.831.]

Both out-of-roundness and the diameter can be checked with the portable "Mikrotast" steel ball gage. The fan-shaped, knife-edge indicator consists of a standard Krupp "Mikrotast" indicator, graduated in 40 divisions of 0.00005 in. or 50 divisions of 0.0001 in. This indicator connects with an adapter carrying a conical cup of Krupp "Nitralloy" at its lower end. The top of the cone is cut away to permit projection of the cone to the gaging contact point.

The gage is set to a master ball. Duplicate steel balls are then inspected by simply dropping the gage on the ball, allowing the gage to bear down by means of its own weight.

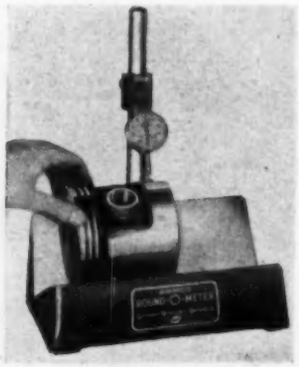
Any out-of-roundness to the fraction of a one-half a ten-thousandth can be detected speedily. Red tolerance markers can be set and locked from without the case.

This gage is made with four adapters to cover the diameter range: 0.400 to 1.200 in.

Gage, "Round-O-Meter," "Ammco"

Automotive Maintenance Machinery Co., 816 West Washington Blvd., Chicago, Ill. [Vol. 73,p.945.] 448.

A direct-reading indicator for checking roundness and size of objects from ¾ to 6 in. in diameter has been announced. Readings are accurate to 0.0005 in.

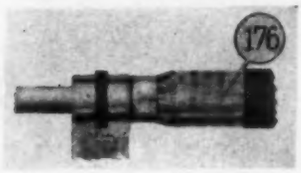


By using "Ammco" gage setting rings, the "Round-O-Meter" can also be used for direct measurement and comparative checking. Gage setting rings are furnished on special order in any specified diameters, over-sizes or under-sizes, within the above range.

Micrometer, Direct-Reading

Lufkin Rule Co., Saginaw, Mich. [Vol.73,p.187.] 39.

This direct-reading micrometer gives the total measurement without difficult and often incorrect additions. This reading is shown at a glance by an ingenious arrangement of the figures on the sleeve. The hub markings are the same as on the regular type of micrometers. Hundreds of thousandths are indicated by a long line. The



three shorter lines indicate 0.025, 0.050, and 0.075, and are arranged so that they appear as a group of three.

Micrometer, Square-Barrel

John Mischker, 8 Wright St., Milwaukee, Wis. [Vol.73,p. 796.] 332.

Quick setting by means of a ratchet to within 0.025 in., and then final measuring by means of a graduated barrel, are features of this square-barrel

micrometer. The measuring stem with its square barrel is removable, and is intended for use with a set of frames of varying sizes.

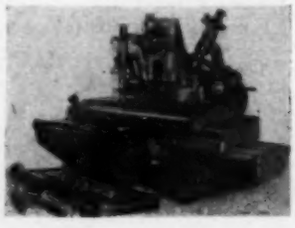
The stem is provided with a short thread sufficient for one complete turn or 0.025 in. movement. An inside stem is provided with the set.

Measuring Machine, Two Co-ordinate, Universal, Société Genevoise

R. Y. Ferner Co., Investment Bldg., Washington, D. C. [Vol. 73,p.900.] 414.

This two-co-ordinate measuring machine is intended for general use in inspection departments of industrial plants. Provision is made to testing thread gages, micrometer screws, worms and taps for pitch, angle of profile, and diameter by means of an optical method.

A heavy cast-iron bed supports the two slides, which move at right angles. The longitudinal slide has a travel of 16 in. It has an opening to permit illumination from below. Pieces to be measured are not



clamped to this slide, but to one of three interchangeable fixtures.

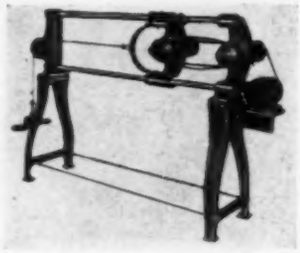
A transverse carriage serves to carry the sighting microscope for measurements in the other co-ordinate. The front part of the transverse carriage has a vertical slide on which the toolholder can be adjusted in height.

The minimum free distance between the T-slotted table and the toolholder is 3 in., the maximum 6¼ in., while the distance from the table to the transverse carriage is 2$\frac{13}{32}$ in. A 6-in. circular table is furnished extra.

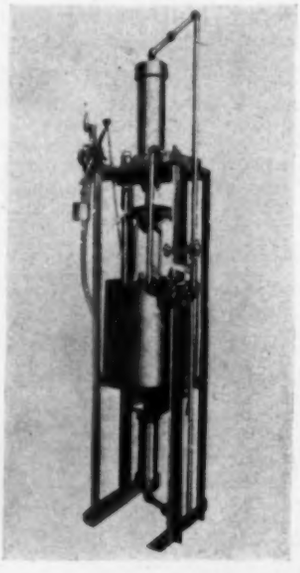
Testing Machine, Belt, Endurance, Norman

Tinius Olsen Testing Machine Co., 500 No. 12th St., Philadelphia, Pa. [Vol.73,p. 1027.] 476.

Destruction tests of V-belts can be made in 100 hours on the Norman endurance testing machine. Each shaft carries two pulleys of slightly different diameters. No power is taken off the driven shaft, but one of the belts tends to drive the shaft a little faster than does the other. In consequence, one belt acts as a brake on the other.



Tension in the belts is produced by dead weights pulling on the sliding crosshead which carries the driven shaft. The machine consumes only power necessary to cover the belt losses. Besides V-belts, the machine is suitable for testing flat belts.



Testing Machine for Brass Fittings

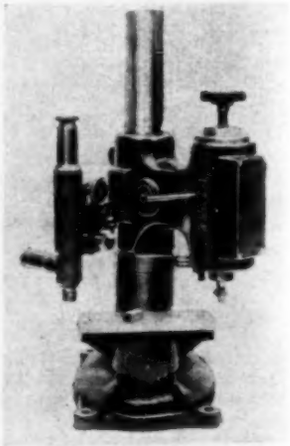
Watson-Stillman Co., 75 West St., New York, N. Y. [Vol.73, p.528.] 207.

Testing of fittings at a speed of 500 to 600 per hour can be effected. All fittings, 90-deg. to 45-deg. elbows, street elbows, tees, crosses, and return bends in sizes up to 1½ in. can be tested at an air pressure of 50 lb. per sq.in. under water. Fittings can be tested either before or after tapping.

Testing Machine, Hardness, "Hardometer"

Firth-Sterling Steel Co. Mckeesport, Pa. [Vol.73,p.185.] 17.

Determining the hardness of very thin specimens and the thin cases of articles surface-hardened by the nitriding process may be done on the "Hardometer" Brinell hardness tester. Special alloy steels of high hardness can be tested satisfactorily. A pyramidal diamond indenter is used, although the hardened steel ball is used for softer metals.

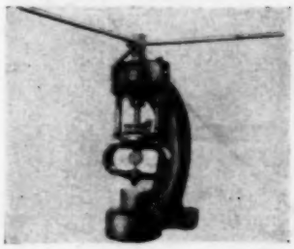


The machine will test the hardness of medium and hard steels down to 1 mm. thick, and soft steels and non-ferrous metals down to 2 mm. thick, when using a 120-kg. load cylinder and a 1-in. microscope objective, or down to ½ mm. thick and 1 mm. thick when using a 30-kg. load cylinder and a ½-in. objective. Maximum space between the anvil and the head of the standard machine is 8 in. Over 100 tests per hour have been made. The machine is provided with a sliding head.

Testing Machine, Hardness, Wazau

Southwark Foundry & Machine Co., Testing Equipment Division, Philadelphia, Pa. [Vol. 73,p.943.] 394.

This Wazau hardness tester is intended for Brinell tests, and is also arranged to measure the depth of indentation similar to



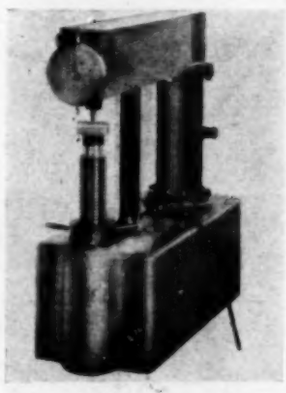
the Rockwell method. The tester is suitable for both shop and laboratory use.

Load is applied by a hand-driven screw and measured by an elastic precision ring dynomometer and dial graduated in 10-kg. divisions. The vertical opening of the press is 4 in. Measurement of the depth of impression can also be taken by observing a scale geared to the main screw. It indicates the vertical movement of the spindle in hundredths of a millimeter.

Testing Machine, Hardness Tester, Brinell, "Diamo"

Pittsburgh Instrument & Machine Co., 1026 Reedsdale St., Pittsburgh, Pa. [Vol.73,p.947.] 449.

Brinell hardness readings are read directly on the "Diamo" Brinell hardness tester. The instrument is operated by a system of weights and levers and



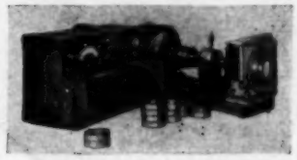
the indentation is produced by a diamond semi-ball of 2 mm. diameter under a load of 120 kg. For soft material the test load can be changed easily from 120 to 30 kg.

Testing Machine, Roller and Ball Bearing

Burgess-Par Co., Room 1806, 111 W. Monroe St., Chicago, Ill. [Vol.73,p.374.] 144.

By means of this instrument, bearings can be sorted more definitely and accurately than by the old method of listening to them. The instrument is sufficiently accurate to sort bearings into as many as five grades between excellent and defective.

The Burgess bearing tester is an acoustimeter. Vibrations are transformed into electrical impulses, amplified so as to deflect the needle of an electrical



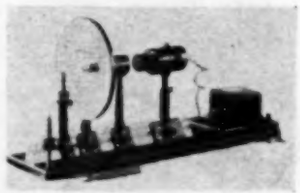
meter. The machine is provided with adaptors to test all bearings from 2 to 6 in.

Testing Instrument for Steel Balls and Rollers, Zeiss

George Scherr Co., Inc., 142 Liberty St., New York, N. Y. [Vol.73,p.834.] 374.

Surfaces of balls and rollers may be inspected for defects in shape or finish on this Zeiss testing instrument. Suitable holders for large and small balls and rollers are furnished.

The light source is a 50-watt,

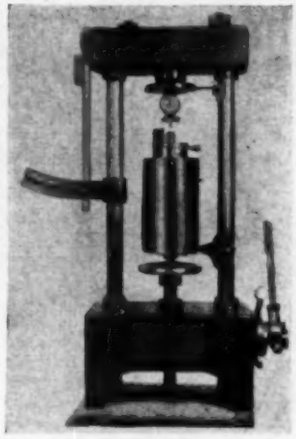


8-volt, incandescent lamp. An objective is supported within the beam of the light issuing from the diaphragm. After concentration the light rays form an intensely bright cone, in which the ball or roller is inserted to be inspected. The ball rests on the holder, which can be rotated. Light reflected from the ball surface is projected onto a spherically shaped screen, on which a sharply focused image appears, disclosing all defects.

Testing Machine, Spring

Coats Machine Tool Co., Inc., 110-112 W. 40th St., New York, N. Y. [Vol.73,p.372.] 138.

When hard, closely-wound springs, which carry a load of 1 lb. for each 0.001 in. compression, are to be tested, a length scale is inadequate for taking accurate readings. For such tests, the dial micrometer and holder attached to the upper compression plate and the spring-loading fixture held in a recess of the lower compression plate have been designed. The dial micrometer is graduated in 0.001 in., and has a spindle travel of 1 in. The lower loading fixture has a dovetail slide and mounted on this slide is a boss with a tit, the combined length of which is equal to the compressed length of the spring. The boss is

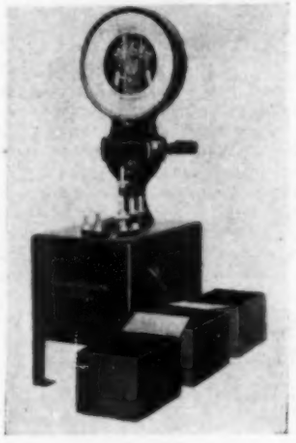


made detachable from the slide, as a different boss is required for each varying closed spring length.

Testing Machine, Spring, Compression, Automatic

Toledo Precision Devices, Inc., Subsidiary of the Toledo Scale Co., Toledo, Ohio. [Vol. 73,p.722.] 335.

Each spring is compressed to a predetermined length, and the expansive force exerted is indicated automatically in pounds on a large dial. Springs are then discharged through a swinging chute, those of the



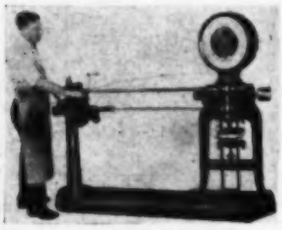
proper stiffness dropping into one bin, those which are too stiff into another bin, and those not stiff enough into a third bin.

The "Auto" gage may be set to test springs of different lengths and different degrees of stiffness, and to sort them within any desired tolerance. Springs are dropped into sockets in a disk.

Testing Machine, Steering-Gear

Toledo Precision Devices, Inc., subsidiary of the Toledo Scale Co., Toledo, Ohio. [Vol. 73,p.799.] 357.

Checking steering gears for hand power required to turn the wheel can be done on this special equipment. The amount of play of the steering wheel is also determined readily, and the angular movement on each side of the center of the drag link



arm is indicated. This device is designed so that it can be made to accommodate any type of steering gear.

Microscope, Toolmaker's, Improved, Zeiss

George Scherr Co., 142 Liberty St., New York, N. Y. [Vol.73,p.832.] 289a.

This model retains the features of previous designs, such as: the dial templet; smooth table movement guided by balls; a freely swiveling table top, and

a quick-acting micrometer crank. The general design has been made more massive and sturdy, and longitudinal movement of table of 3 in. permits the use of gage blocks.

The cradle for the centers and V-blocks can be clamped to the table. The box-type column can be swiveled for bringing the microscope tube and illumination jointly into angular position for projecting the helix angle of a thread. Measurement of pitch diameter to within the limits of 0.0002 in. can be made.

Specifications: Cross travel of table, 1 in.; longitudinal travel of table, 3 in.; magnification, 30 times; range of micrometers, 1 in.; graduation of micrometers, 0.0001 in.; reading of angles on universal ocular, 1 min.; reading of angles on dial templet, 10 min.

A special projection attachment, for converting the Zeiss toolmaker's microscope into a projector is available, making observation visible to both eyes from an image on the screen.

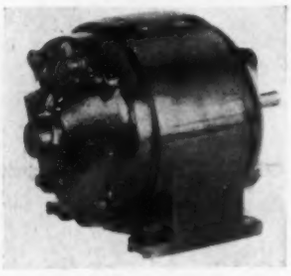
Electrical Equipment

Motor, Clutch-Type

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.300.] 90.

This motor, which has high starting torque, is of ¼ hp., and runs at 1,725 r.p.m. It is of the split-phase type and is especially suitable for driving small machines for operation on 110-volt circuits.

The motor delivers a series



of power impulses that tend to overcome the static friction and inertia of the load and to bring it up to speed. Power impulses increase until load is started. The motor will deliver 680 per cent full load torque at starting.

Motor, Squirrel-Cage, Totally Enclosed, Fan-Cooled Type J

Louis Allis Co., Milwaukee, Wis. [Vol.73,p.341.] 135.

This is a modification of the Type R motor. Additional refinements include "cartridge type" bearing chambers, and simple devices for removing the

fan, ventilating shell, and heads quickly. Type J is a totally enclosed motor sealed inside a sheet-steel ventilating shell. Cast iron heads are used. No pipe connections or air ducts are required.

Motors, Fan-Cooled, Large

Reliance Electric & Engineering Co., 1088 Ivanhoe Road, Cleveland, Ohio. [Vol.73,p.529.] 174.

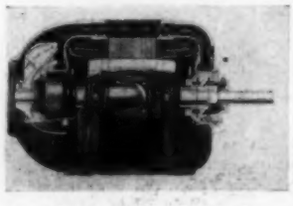
By employing the Mossay principle of cooling, large, inclosed, fan-cooled motors, from 20 to 150 hp. can be supplied. They are interchangeable in mounting dimensions with standard open motors of the same

horsepower and speed rating. Extra cooling area is obtained by the use of tubes extending over the outside of the stator. A single internal fan on the rotor circulates the confined warm air through the tubes.

Motors, Totally Inclosed, Fan-Cooled, Type K

General Electric Co., Schenectady, N. Y. [Vol.73,p.647.] 266.

These motors are equipped with ball bearings in "cartridge" housings, and have the same mounting dimensions as the standard open-type motors from ¾ to 50 hp. in popular speeds.



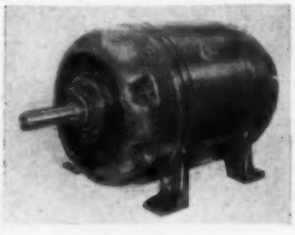
The single ventilating fan is located outside the motor inclosure on a short shaft extension. A double frame is used, providing air passages for the ventilating air. The motor is endorsed by the Underwriters' Laboratories for hazardous dust conditions, specified as Class 2 in the National Electric Code.

Motors for Hazardous Conditions

General Electric Co., Schenectady, N. Y. [Vol.73,p.760.] 302.

Totally inclosed, fan-cooled motors for the hazardous conditions specified as Class 1 in the National Electrical Code, are now built. The line conforms in most ratings to the mounting dimensions of open, general-purpose motors.

The polyphase induction motors comprise ratings from ¾ to 30 hp. in popular speeds, and are especially designed for use

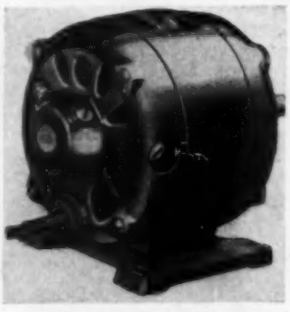


in explosive gas conditions classified as Class 1, Group D. Single-phase motors now built are rated from ½ to .2 hp., totally inclosed, for the same service, and fractional-horsepower ratings from ¼ to ½ hp., the latter either in repulsion-induction or direct-current types.

Motors, Fractional-Horsepower, Type N-5

Bodine Electric Co., 2254 West Ohio St., Chicago, Ill. [Vol.73,p.901.] 415.

Type N-5 fractional horsepower motors will ultimately replace the older Types SA and SD motors. Two frame sizes are now built, having ratings of 1/20 and 1/12 hp., at 1,125



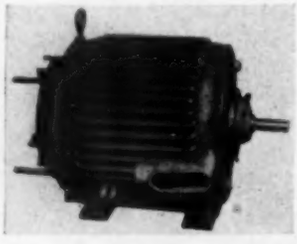
r.p.m. and 1/15 and ¼ hp. at 1,725 r.p.m.

The Type N-5 frame is equipped with specially developed wool-packed bearings. A leaded bronze bearing is used. The ventilation has been increased considerably, so that ratings for a given frame size range from 15 to 30 per cent above the older types.

Motors, Totally Inclosed, Fan-Cooled, "Linc-Weld"

Lincoln Electric Co., Cleveland, Ohio. [Vol.73,p.910.] 421.

Arc-welded steel construction is employed in the line of "Linc-Weld," totally inclosed, fan-cooled motors. These motors



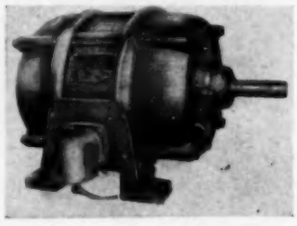
also employ double-sealed ball bearings and a removable cover that facilitates easy cleaning of the large corrugated radiating surface. Air imprisoned within the corrugated frame is constantly circulated by a fan arc-welded to the rotor. A fan on the motor shaft circulates external air over the corrugated surface.

These "Linc-Weld" motors have the same mounting dimensions as standard, open-type, horizontal motors of equal rating. Sizes manufactured are from 1 to 50 hp.

Motors, Unit-Type

The Ideal Electric & Manufacturing Co., Mansfield, Ohio. [Vol.73,p.985.] 442.

Induction, squirrel-cage, slip ring, and d.c. motors, in all sizes and types from ¼ to 200 hp., are now available in unit designs. Standardization has per-



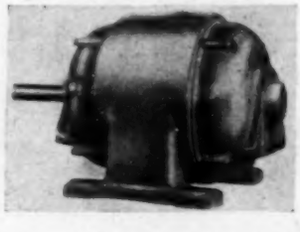
mitted interchangeable rotors and stators. Thus, standard horizontal motors, shell-type motors, flange-type motors, vertical motors, and special applications of "built in" motors requiring only the active elements, all take the same rotors and stators.

Anti-friction bearings are supplied as standard. They are of the cartridge type, and direct fittings with automatic seals are used to supply grease under pressure.

Motors with Herringbone Rotors

Sterling Electric Motors, Inc., Telegraph Road at Atlantic Blvd., Los Angeles, Calif. [Vol. 73,p.986.] 443.

Motors from 1 to 50 hp. are now built with herringbone rotors to achieve quiet operation. Other features are: no

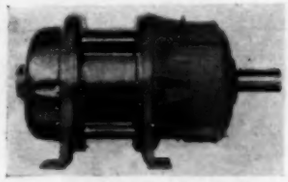


back and forth lateral pounding; no circulating currents; improved pull-out efficiency and power factor; and reduced starting current, heating, eddy currents, and iron losses.

Motors, Front-Gear

Watson-Flagg Machine Co., 107 Nineteenth Ave., Paterson, N. J. [Vol.73,p.979.] 475.

Helical-gear reduction units are built into the end shield of a standard electric motor to form front gear motors. Except



for a very slight increase in over-all length the combination is practically the same in appearance as the motor alone.

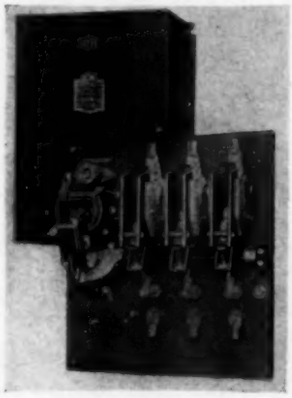
Anti-friction bearings are used throughout, and are dust-proof and oil-tight. Standard N.E. M.A. motor frames are employed.

These front gear motors are available for any speed motor from 3,600 r.p.m. down and from ¼ to 30 hp. Stock ratios the 11⅔ : 1, 11 : 1, 10½ : 1, 9; 1, 8 : 1, 7 : 1, 6 : 1, 5 : 1, and 4 : 1.

Contactors, Magnetic, A.C.

Cutler-Hammer, Inc., 2 12th St., Milwaukee, Wis. [Vol.73, p.179.] 10.

These two magnetic contactors for heavy-duty a.c. service are rated for maximum capacities of 300 and 600 amp. They are arranged for either two- or three-wire control, and have

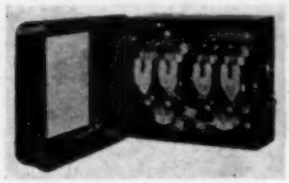


continuous-duty operating coils and heavy, butt-type, solid copper contacts. An air cushion absorbs the shock of the magnet on closing. For general use, the 300-amp. contactor is mounted in a wall-type inclosure, and the 600-amp. size in a floor-type case.

Contactor, Reversing, for Small Motors

Square D Co., Industrial Controller Div., Milwaukee, Wis. [Vol.73,p.337.] 108.

This Class 8711 contactor for small motors is for use primarily in operating controls on small machine tools and is manufactured in two types, one for two-wire control only and the other for two- and three-wire control. The starter may be wired for controlling single-phase, three- or four-wire reversible motors, or three-phase

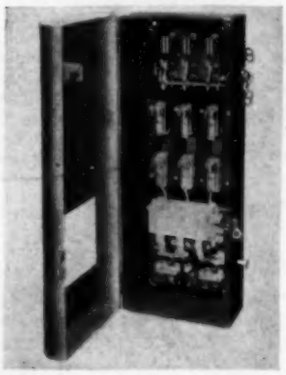


motors. It consists of two double-pole, double-break contactors mechanically interlocked and mounted side by side. Starters for use with single- and three-phase motors are available in 1½-hp., 110-volt, or 3-hp., 220-volt models.

Contactors, A.C., Classes 8532-6 & 7K

Square D Co., Industrial Controller Division, Milwaukee, Wis. [Vol.73,p.534.] 212.

These starters for a.c., across-the-line service are known as Classes 8532K, 8536K, and 8537K. They consist of an auto-



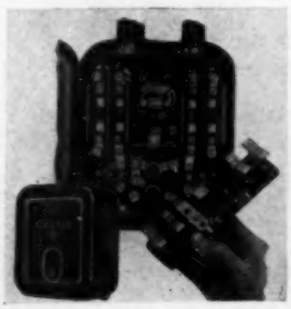
matic starter providing low voltage and overload protection, and a quick-make and quick-break knife switch mounted in the same cabinet.

These starters can be supplied either not fusible or fusible. They may be controlled by push buttons or automatic pilot switches.

Contactor, Magnetic, "Twin Break"

Cutler-Hammer, Inc., 80 12th St., Milwaukee, Wis. [Vol.73, p.607.] 261.

The entire line of Type AAA automatic starters for small a.c. motors has been redesigned to



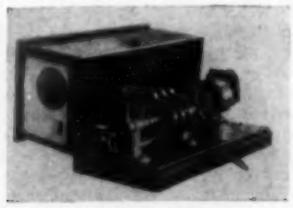
incorporate a "Twin Break" magnetic contactor. This contactor provides for reducing the arc voltage by half, and the Thermoplax arc pockets, by reducing the air content around the contacts, actually prevent the formation of a destructive arc.

A magnetic latch has been added to prevent accidental closure of the contacts. The contactor is made in three- and four-pole types, the maximum rating for two- or three-phase circuits being 3 hp., 110 volts; 5 hp., 220 volts; and 7½ hp., 440 or 550 volts.

Contactors, Time-Cycle, "Automatic"

Automatic Temperature Control Co., Inc., 34 East Logan St., Philadelphia, Pa. [Vol.73, p.985.] 305.

Automatic operation of various processing equipment can be controlled by means of these time-cycle contactors. Contac-

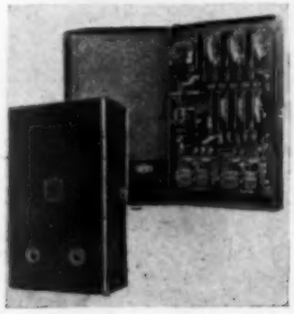


tors to meet these varied demands may be classified under two general groups: (1) Cycle repeating contactors, designed to repeat periodically the cycle so long as the line switch is closed, and (2) cycle stop contactors, designed to start from a push-button switch, run the time-cycle set, and stop until the starting switch is again actuated. Duration of the cycle may be a few seconds or several days.

Controllers, Multi-Speed-Motor

Cutler-Hammer, Inc., 2 12th St., Milwaukee, Wis. [Vol.73, p.723.] 293.

Two-speed, consequent-pole-type (reconnected), squirrel-cage motors can be controlled by means of the Bulletin 9739 automatic controller. This device functions to start the motor



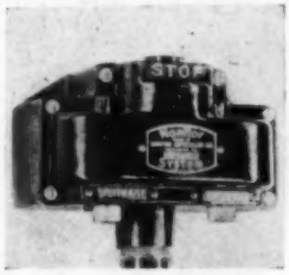
and to change its speed by reconnecting the motor windings. It provides thermal overload protection at both motor speeds and low-voltage protection. A separate push-button master switch provides three-wire remote control.

The controller is furnished for constant-horsepower, constant-torque, or variable-torque motors. A sequence-compelling feature can be furnished.

Master Station, Push-Button

Monitor Controller Co., Baltimore, Md. [Vol.73,p.982.] 454.

It is available for use in either a.c. or d.c. circuits to provide for ward and reverse momentary contact control. The for-



ward and reverse buttons are in a protected position at the bottom, and the stop button is placed at the top.

Starting Switch for Small Motors

Cutler-Hammer, Inc., 80 12th St., Milwaukee, Wis. [Vol.73, p.32.] 63.

The company is offering a Bulletin 9130, two-pole, push-button-operated starting switch with thermal overload relays.

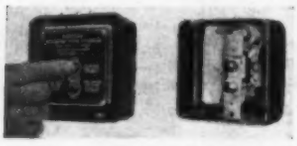
This switch can be used with d.c. motors up to ½-hp., 115 volts and ½-hp., 230 volts, or with a.c. polyphase motors, one-, two-, or three-phase up to 2-hp., from 110 to 550 volts. The inclosing case is a standard wiring box.

Resister-Starter, for Small Motors

Cutler-Hammer, Inc., 80 12th St., Milwaukee, Wis. [Vol.73, p.302.] 117.

Fractional-horsepower d.c. and single-phase a.c. motors can be controlled by means of this

resister-type starter. This starter is designed particularly for those applications where power company rulings require that the inrush current of small motors connected to lighting circuits be held within definite lim-



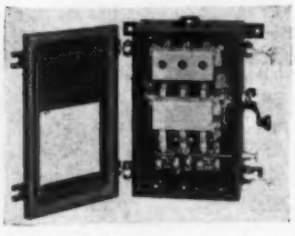
its. On starting, a resistance is inserted in series with the motor. Thermal overload protection is provided.

Maximum ratings are: ¼ hp., 115 volts, d.c.; and ¾ hp., 110 or 220 volts, a.c.

Inclosures for Automatic Starters, Dust-Tight

Square D Co., Industrial Controller Div., Milwaukee, Wis. [Vol.73,p.338.] 110.

This dust-tight inclosure is across-the-line and combination starters. Cabinets are of heavy-gage steel. Cast-iron conduit flanges with live-rubber gaskets



are furnished on the top and bottom of the cabinet to insure dust-tight conduit connections. For the thermal overload relays, a dust-tight push-button is furnished.

Starters, A.C. and D.C.

Square D Co., Industrial Controller Division, Milwaukee, Wis. [Vol.73,p.340.] 109

These starters are designated as the Class 8531 a.c., two-pole, and the Class 8731 d.c., two-pole, switches for across-the-line starting of small motors. They have a floating contactor armature, and two-pole, double-break contacts. The overload

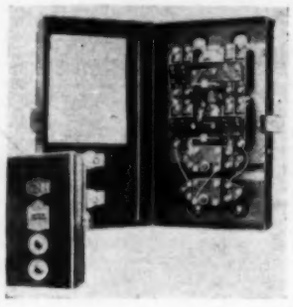
relay is of the thermal time-limit type with an external reset button in the cover. Low-voltage release is provided with two-wire control and low-voltage protection with three-wire control.

The a.c. starter is for use with motors up to 1½ hp. at 110 volts and up to 3 hp. at 220 volts. The d.c. starter is for use with motors up to 1 hp. at 115 and 230 volts.

Starters, Automatic, for A.C. Multi-Speed Motors

Cutler-Hammer, Inc., 80 12th St., Milwaukee, Wis. [Vol.73, p.453.] 193.

These inclosed automatic motor starters for two-speed, separate-winding type, squirrel-cage motors are known as Bulletin 9736, and are the across-



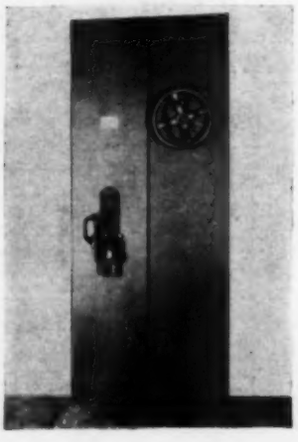
the-line type. A push-button master switch is employed for remote control.

The starter can be furnished in three types: For starting on either winding; with a sequence-compelling feature, and with an automatic sequence control relay. The starter mechanism consists of two magnetic contactors mechanically interlocked, and two sets of thermal overload relays.

Starters for Wound-Rotor Motors

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.530.] 199.

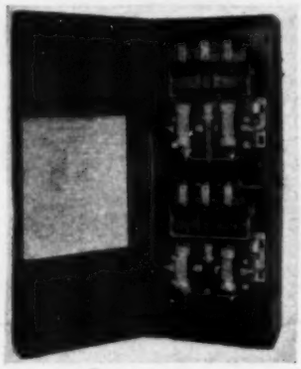
For complete control of the primary and the secondary of a wound-rotor induction motor in a single compact unit, the above concern has developed the Class 12-600 control panels, a line of manually operated, non-reversing, starters and speed regulators. These control panels are used with motors driving pumps, fans, and applications where the infrequency of operation makes manual control desirable.



Starter, Air Motor, Type A-30-R

Condit Electrical Manufacturing Corporation, Boston, Mass. [Vol.73,p.906.] 434.

A reversing, across-the-line air motor starter for the control of squirrel-cage, induction motors has been placed on the

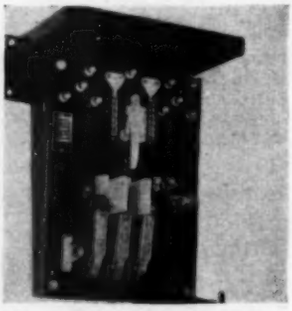


market. The starter, known as the Type A-30-R, consists of two of the Type A-30 arc-prevention motor starters mounted in an inclosing case and mechanically interlocked. The Type A-30-R starter is furnished for push-button control up to 20 hp., 550 and 440 volts; 15 hp., 220 volts, and 7½ hp., 110 volts.

Starter, Thermaload

Monitor Controller Co., Baltimore, Md. [Vol.73,p.941.] 426.

Across-the-line, full voltage starting is permitted by means of the oil-immersed "Thermaload" starter. This device is equipped with overload and



low-voltage protection, and consists of a magnetic contactor mounted on a panel with a thermal relay enclosed in an oil-tight box. This starter gives positive protection to polyphase and single-phase motors.

N.E.M.A. ratings are: 7½ hp. at 110 volts; 15 hp. at 220 volts, and 25 hp. at 440 volts.

Starter, Manual, with Push-Button Reset, "I-C"

Industrial Controller Division, Square D Co., Milwaukee, Wis. [Vol.73,p.982.] 455.

All poles of the Class 2510 manual starter are opened simultaneously with the tripping

of either of two relays. The starter is reset for operation by pressing the button extending through the front cover. Another feature is the trip-free handle. The three-phase ratings of this starter are: 5 hp., 220 volts; and 7½ hp., 440-550 volts.

Switch, Pilot, Three-Position

Cutler-Hammer, Inc., 2 12th St., Milwaukee, Wis. [Vol.73, p.337.] 94.

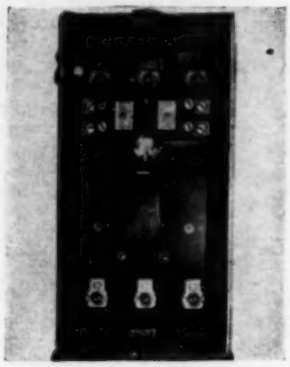
Motor-driven pumps, compressors, and similar machines, which are controlled by an automatic pilot device such as a

float switch, pressure switch, and time clock, require this three-position pilot switch. The operating lever can be placed in either the "automatic," "off," or "manual" positions. It consists of a two-button, push-button switch inside the case.

Switch, "Motor Watchman," Type WK-16

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.452.] 178.

A motor starting switch especially suitable for use with textile loom and machine tool motors has been built. This is a small, simple, and inexpensive motor starting switch with resettable automatic overload protection. All ratings are inclosed in the same size box, 4¾ in. wide, 9 in. long, and 3⅛ in. deep. Front handle operation and the choice of top or bottom arrangement of line terminals are additional features.



Switch, Magnetic, Type CR-2811

General Electric Co., Schenectady, N. Y. [Vol.73,p.835.] 377.

For use on either a.c. or d.c. circuits, the CR-2811 magnetic switch is provided with a latch to hold the contactor closed. This condition is particularly desirable for conditions where: (1) the hum of a standard

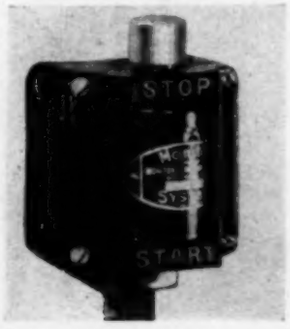
magnetic switch must be eliminated; (2) where the power consumed to hold the contactor closed by the usual method must be eliminated because of cost, and (3) where the switch must not open in case of coil failure, power failure, or short circuits.

The device consists of a two- or three-pole, a.c. contactor with a latching mechanism mounted on a base and with or without an inclosing case. The standard contactor has an extended shaft.

Switch, Push-Button, Ironclad

Monitor Controller Co., Baltimore, Md. [Vol.73,p.872.] 381.

For momentary contact control, especially on machine service, the Ironclad push-button switch is suitable for a.c. or d.c.



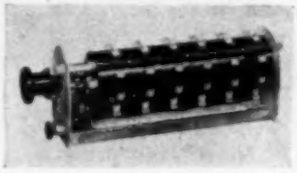
circuits. Features of this switch include quick-action inching, massive and flexible contacts, and buttons located for safety. The stop button is on the top, fully exposed and easy to operate. The start button is placed below and fully protected from accidental contact. The switch is both drip- and splash-proof.

Over-all height is 4¼ in., width, 2 1/16 in., and depth from mount 2⅜ in.

Switch for Changeable-Pole Motors

General Electric Co., Schenectady, N. Y. [Vol.73,p.1019.] 483.

Two switches for use with multi-speed, changeable-pole motors bear the designations CR-2960-SY-108 and SY-113,



and have maximum capacities of 5 hp. and 10 hp. These switches, when used with multi-speed, squirrel-cage, induction motors, permit obtaining different speeds by changing the polar grouping of the stator coils. For small motors one of these switches will serve as a starting switch, as well as a pole-changing switch.

Volt-Ammeter, Type PD

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol, 73,p.418.] 170.

A group of pocket-size current Type PD portable volt-ammeters is being produced. Type PD volt-ammeters are 4½

in. wide, 5 in. long, and 1⅝ in. deep. Scale length is 3 1/16 in. Accuracy is to within 1 per cent of full-scale value.

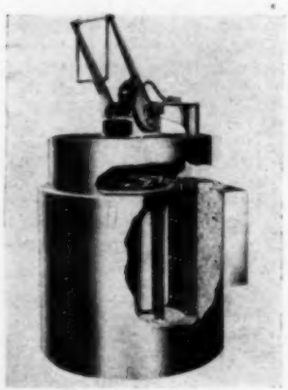
The movement employed is a d'Arsonval instrument, and is available in five different sizes, each in four types.

Furnace and Oven Equipment

Furnace, Air-Drawing

General Electric Co., Schenectady, N. Y. [Vol.73,p.493.] 215.

The furnace is designed for drawing steel at temperatures up to 1,200 deg. F. Heating units are of heavy nickel-chromium ribbon. A fan of heat-resisting alloy circulates air



through the charge. Positive automatic control of the temperature of the air is provided. By using an auxiliary cover and a suitable retort, the furnace may be used for nitriding. The furnace walls are of light-weight refractory, backed with heat-insulating material and protected by a welded steel casing.

Furnace, High-Temperature, with Reducing Atmosphere

General Electric Co., Schenectady, N. Y. [Vol.73,p.535.]

This production-type furnace for temperatures up to 2,600 deg. F., is especially adaptable to processes requiring a reducing atmosphere such as copper brazing and the brazing of Carboloy tool tips to steel tools.

The heating element consists of molybdenum wire and operates in a hydrogen atmosphere to prevent oxidation. Work is allowed to cool in the hydrogen atmosphere. Two cooling chambers are provided, the second one being equipped with a water jacket.

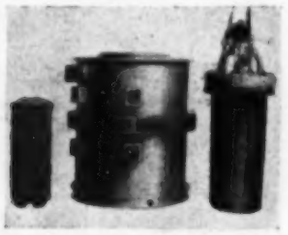
The furnace has a rating of

10 kw. at 220 volts, single-phase. Heating chamber dimensions are 2½ ft. long by 4 in. high by 6 in. wide. Gas consumption is about 30 cu.ft. per hour. Automatic temperature control is provided. Dimensions, 5 ft. 4 in. high by 6 ft. long by 2 ft. 10 in. wide.

Furnace, Carburizing, Vertical

Hevi-Duty Electric Co., Milwaukee, Wis. [Vol.73,p.573.]

This vertical pressure-carburizing furnace is a standard crucible type, having heating elements mounted in the side wall. A three-section alloy basket, in which the charge is placed, fits into a nickel-chromium retort, bolted and sealed air-tight to the cover. The cover has a motor-driven fan for circulating the carburizing



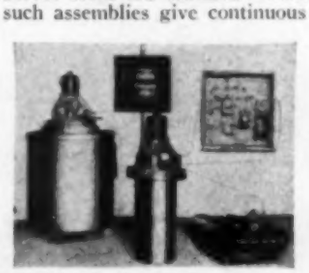
gases, which are premixed in an automatic device.

Four heats can be run in 24 hours on ordinary normalized carburizing steels, with a penetration of approximately 1/16 in. at a retort temperature of 1,675 deg. F.

Furnace, Nitriding, Type HD-1020

Hevi-Duty Electric Co., Milwaukee, Wis. [Vol.73,p.608.] 244.

Small production requirements can be met with this nitriding furnace. It is a standard crucible type, having a regular nickel-chromium coil and nickel-chromium retort. Work is placed in perforated baskets. The retort and cover function as a unit for insertion or removal from the furnace. Two such assemblies give continuous



use of the furnace. The retort can be gassed prior to placing it in the furnace.

Control equipment includes indicating and recording controlling pyrometers, a control panel, two thermocouples, and the necessary lead wire.

Two ammonia tanks are connected to a common manifold. Dissociation equipment consists of pipettes and bubble bottles. The time cycle is 30 hours.

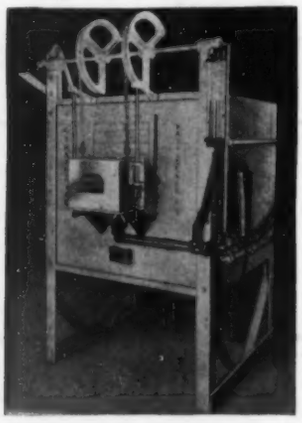
Dimensions are: height, 68

in.; diameter, 48 in.; retort height, 20 in., and retort diameter, 10 in. Electrical specifications: kilowatt rating, 18; phases, 1; and voltage required, 230, a.c.

Furnaces for High-Speed Tools, "Certain Curtain"

C. I. Hayes, Inc., 129 Baker St., Providence, R. I. [Vol.73, p.795.] 308.

Positive control of the neutral atmosphere is secured in the "Certain Curtain" furnaces. One of these furnaces was previously described on page 1018, Vol. 69, of *American Machinist*. Improvements are: A raised hearth to permit circulation of heat below the hearth as well



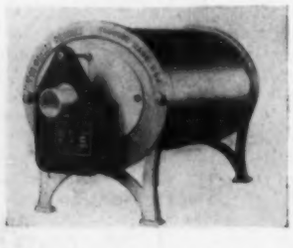
as above; the addition of a manometer at the front for determining the mixture used; and increased thermal efficiency and decreased power consumption.

Furnaces are designed for use on a.c. circuits, single-phase, or d.c. circuits at 110 or 220 volts. Light-duty furnaces are available in three models, the first two being bench types. Heating chambers for the five heavy models range from 4 in. high by 8 in. wide by 12 in. long to 12 in. high by 16 in. wide by 30 in. long. Capacities range from 24 to 69 kw.

Furnace, Tube, Model "U"

Sentry Co., Taunton, Mass. [Vol.73,p.495.] 190.

For operating at higher temperatures than the conventional type, this Model U tube furnace is designed for combustion analysis, although it may be used for small tool hardening.

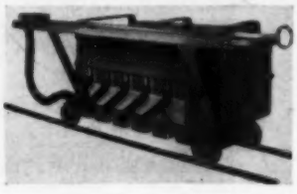


Temperatures up to 1,400 deg. C. (2.252 deg. F.) can be withstood. The furnace is arranged to receive a tube 1½ in. in bore x 1¾ in. outside diameter, and has a heating chamber 9 in. long. The normal heating time at 800 deg. C. is 30 min.

Heater, Billet, 6-Ft., "Berwick"

American Car & Foundry Co., 30 Church St., New York, N. Y. [Vol.73,p.650.]. 298.

Bars 1 in. in diameter by 6 ft. long can be heated to 1,900 deg. F. in one minute on this "Berwick" billet heater. Such bars

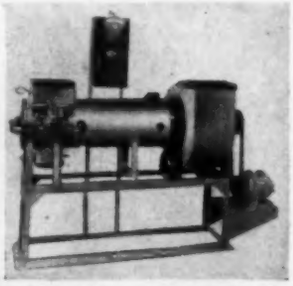


are of use for hand-feed bolt and rivet machine. From 10 to 15 kw. are required per 100 lb. of material. About 72 volts are employed at the terminals of the machine. Such bar heaters can be built for stock from 4 ft. to 10 ft. in length.

Recirculation and Incineration Equipment for Enameling Ovens

The Paul Maehler Co., 2208 West Lake St., Chicago, Ill. [Vol.73,p.416.] 186.

Equipment to be located outside of such ovens for the purpose of supplying heat and incinerating the vapors distilled from enamel has been developed. Recirculation of air through the oven by means of this equipment

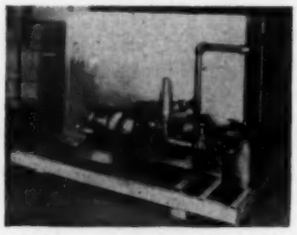


causes more uniform temperature throughout the oven interior to be obtained and the quality of work to be bettered. The air and vapors are drawn from the top of the oven by a high-temperature suction fan located at the exhaust end of the heater, passed through the heater, and returned to the bottom of the oven. The heater has shown a continuous efficiency of 95 to 99 per cent and operates at a temperature one-third above the oven temperature. It also derives heat from burned vapors.

Finish Conditioning System

Despatch Oven Co., 622 Ninth St., Minneapolis, Minn. [Vol.73,p.910.] 422.

Dirty, off-color, and streaked finishes are eliminated by the finish conditioning system. It is designed particularly for use with dipping and flow methods. The system is a combination

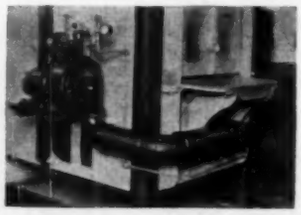


of strainer and agitator. Finishing material is taken from the dip tank or flow coating device by a specially designed rotary pump.

Oil Burner, Automatic, for Industrial Furnaces, Model DI

Ryan, Scully & Co., 3711 Wissahickon Ave., Philadelphia, Pa. [Vol.73,p.986.] 472.

The Model DI industrial low pressure automatic oil burner consists of a burner, blower, pump, strainer, regulating



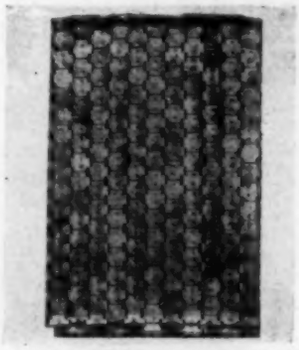
valves, atomizer, and complete automatic control assembled in one unit. It is offered to meet small furnace firing requirements and can be installed on standard one-burner heat-treating or carburizing furnaces.

Belts, Furnace-Conveyor, "Spicer"

Ryan, Scully & Co., 3711 Wissahickon Ave., Philadelphia, Pa. [Vol.73,p.944.] 391.

For use in continuous furnaces and quench tanks, two types of link belts are offered. One is the link-space-link-space type, and the other is a solid-surface link type. The first type presents a metal surface 60 per cent of the total area. It weighs approximately 3 lb. per sq.ft. Where small parts are to be handled, the 90 per cent belt, illustrated, is used. Parts ⅛ in. or larger can be handled. The weight is approximately 4¾ lb. per sq.ft.

Both of these belts are flexible, non-stretching and non-

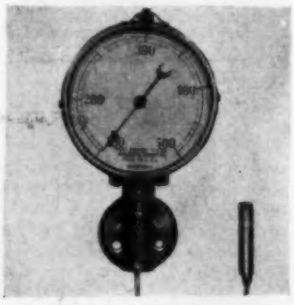


shrinking. They are guaranteed for 2,000 hours minimum life at 1,600 deg. F.

Gages, Temperature-Control, Automatic

Harold E. Trent Co., 439-43 No. Twelfth St., Philadelphia, Pa. [Vol.73,p.565.] 237.

Of the four gages, two are indicating controlling instruments covering the range from 100 to 1,000 deg. F. The Type 400 is for temperatures from 100 to 500 deg. F., and



operates within 2.5 deg. plus or minus. The Type 800 holds the temperature to within 5 deg. over the range 200 to 1,000 deg. F.

The Types NI-5 and NI-10 are non-indicating controllers with 20 arbitrary divisions on the front plate, an index, and a pointer.

Pyrometer, Potentiometer

Uehling Instrument Co., 166 Vesper St., Paterson, N. J. [Vol.73,p.341.] 134.

The instrument lends itself to measuring and recording temperatures where a high degree of accuracy is desired. Either

a thermo-couple or an electric resistance bulb may be used as the temperature element.

Although this recorder retains all the advantages of the potentiometer, the contact method permits placing the galvanometer at almost any distance from the recorder.

Pyrometer Controller, Indicating, No. 801

Brown Instrument Co., Philadelphia, Pa. [Vol.73,p.798.] 368.

Readings can be observed directly on the 6-in. scale of the Model 801 indicating pyrometer controller. An index on the scale may be used for setting

to the exact control point. Mercury switches up to 30-amp. capacity eliminate necessity for relay equipment. Suitable "on and off" or "three-position" controls can be made through switches, valves and dampers. A safety device opens the furnace circuit if the thermocouple or wiring fails.

Temperature Cutout, Excess, Automatic

Hevi Duty Electric Co., Milwaukee, Wis. [Vol.73,p.725.] 315.

To guard work and furnaces against damage from overheating, an automatic excess temperature cutout has been developed. It responds to a

thermocouple located in the furnace chamber and actuates a thermal cutout to control a relay. Adjustable controls are provided. It can be used for temperatures up to 3,000 deg. F. with accuracy.

Temperature and Safety Control for Industrial Ovens

Paul Maehler Co., 2208 West Lake St., Chicago, Ill. [Vol. 73,p.1018.] 487.

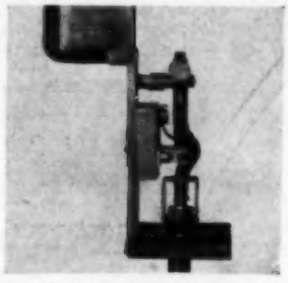
A completely automatic control in one unit to secure positive temperature control and to provide uniform baking condi-

tions at all times is known as the Maehler electrical control unit. The cabinet measures 20x16x5 in. In the cabinet are assembled the various devices providing automatic control. Attached to the outside is the indicating controller, which may be set for any temperature desired. The electrically operated temperature control valve closes or opens automatically, thus retarding or increasing the fuel supply. On the heater itself is located a Maehler-Maxon automatic shut-off safety valve.

Thermostat Control for Melting Pots

General Electric Co., Schenectady, N. Y. [Vol.73,p.72.] 15.

A quartz rod thermostat for controlling the temperature of melting pots for use with lead, tin, babbitt, solder and other white metals has been de-



veloped. It has a temperature range of 450-950 deg. F., and will control temperatures to within plus or minus 14 deg. F. of its setting.

Material Handling Equipment

Crane, Industrial, Portable, Type B-36, "Tec"

Terminal Engineering Co., 17 Battery Place, New York, N. Y. [Vol.73,p.182.] 52.

The capacity of this crane is 3,650 lb. at a distance of 2 ft. from the end of the chassis, or 750 lb. at a distance of 14 ft. The boom telescopes a distance of 6 ft. Both the boom and the hook are operated independently from two separately driven

hoist units. The 4-wheel drive is equipped with a motor on each wheel.

The maximum height of lift is 17 ft. 6 in. on the standard model. The machine can pass through doorways as low as 72 in. Power is supplied to the crane from a storage battery which is large enough to operate an electric magnet, as well as to perform propelling and hoisting duties. The single-unit battery is carried in a steel container.

Crane, Truck, Portable, Electric 6,000-Lb., Type G E G

Automatic Transportation Co., Inc., Buffalo, N. Y. [Vol.73,p. 219.] 88.

Rated capacity of 2,500 lb. at 12 ft. radius illustrates the size and heavy construction of the Type GEG portable electric crane truck. Rated capacity at 5 ft. is 6,000 lb. The main chassis is constructed of structural steel shapes, braced, gusseted, and hot riveted.

The main column base upon which the crane structure revolves is riveted to the main chassis. The revolving crane structure, which supports the battery compartments, boom, and hoist mechanism, is built up of a one-piece steel base.

The boom can be slewed through 150 deg. on either side of the truck.

Crane, Portable, Variable-Height, Clarktor

Clark Tructractor Co., Battle Creek, Mich. [Vol.73,p.835.] 380.

Capacity to lift 2,000 lb. to 13 ft. is found in the "Clarktor" variable-height crane. When the boom is horizontal, the en-

tire equipment has an over-all height of 7 ft. 10 in.

The chassis employed is the "Clarktor" Tructractor, which has a short turning radius of 108 in. Standard truck transmission, a Clark truck axle, and a multiple-disk clutch are other features. The tractor-type gas engine uses 5 or 6 gal. of gas and a pint of oil daily.

Hoist, Compact

Shepard Niles Electric Crane & Hoist Corporation, 388 Schuyler Ave., Montour Falls, N. Y. [Vol.73,p.1024.] 493a.

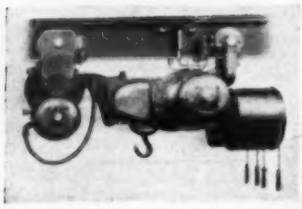
The "Compact Hoist" embodies sectionalized construction. By the use of the same body piece and attaching different motor and gear end sections, varying requirements of speed or capacity can be met. The load block is fully inclosed

except on the close-clearance type of hoist. An improved electric brake and limit switch are now embodied. Ball bearing trolley wheels for the push type trolley afford ease in operation along a runway beam.

Trolley, Model 21

Shepard Niles Electric Crane & Hoist Corporation, 388 Schuyler Ave., Montour Falls, N. Y. [Vol.73,p.1024.] 493b.

The Model 21 trolley illustrated is completely assembled with a "Compact Hoist" made by the concern and described under previous item. Design features of the trolley are: All



steel construction; ball bearings throughout; grease lubrication; motor mounted directly underneath trolley sides; trolley capable of negotiating small radii down to 3 ft. 4 in. minimum and through narrow throw switches; guide rolls to prevent skewing of trolley; trolley designed to operate on standard I-beams and certain sizes of I-beams with Shepard Track.

Truck, Multiple-Lift

Barrett-Cravens Co., 1328-1342 W. Monroe St., Chicago, Ill. [Vol.73,p.374.] 149.

Features of the truck are: a spring handle holdup; an automatic handle releasing latch; and a special long-leverage lifting mechanism. Timken roller bearings are used throughout. The

mechanism is totally enclosed on top. A hydraulic check of improved design is placed under the center of the load.

The truck is capable of lifting loads with the handle located anywhere in an arc of 200 deg. The truck has a capacity of 6,000 lb., and is available with lifts of either 2½ or 3 in.

Truck, Lift, Electric

Crescent Truck Co., Lebanon, Pa. [Vol.73,p.375.] 158.

For use with hand-truck platform skids of 7 in. high or more, operating costs of this truck, designed to fit into a field between heavier industrial trucks and the ordinary hand lift truck, is claimed to be less than $0.18 per hour, except the operator's wages.

The capacity of the truck is 3,500 lb.; the over-all length, 88 in., and the over-all width, 33 in. It has a turning radius of 7 ft., and a lifting platform, 20 in. wide and 40 in. long. Two speeds forward and two speeds in reverse are provided. Fafnir ball bearings and Timken roller bearings are used throughout. Standard Exide or Edison assembly batteries are used.

Lift, 3½ in.

Trucks, Lift, 1¾ and 10-Ton

Elwell-Parker Electric Co., Cleveland, Ohio. [Vol.73,p.684.] 297.

The big truck shown has a rated capacity of 10 tons. The lift platform measures 40x144 in. and stands 18 in. from the

floor. The small truck was developed to handle hand lift truck skids, and is rated at 1¾ tons. Its platform dimensions are 18x41 in. and has a 7 in. clearance. Drop forged parts are employed throughout both machines. Timken bearings are employed for the steering mechanisms.

Truck, "Stock Chaser"

Clark Tructractor Co., Battle Creek, Mich. [Vol.73,p.760.] 288.

The equipment consists of a sturdy 3-wheeled, gas-propelled tractor, equipped at the rear with a steel platform box 33½ in. wide by 29½ in. long and having a load capacity of 500 lb.

This equipment, with a turning radius of but 51 in., is a mechanical errand boy. The rear platform is removable, after which the equipment may be converted into a factory tractor with a standard trailer coupler, capable of hauling 25 tons.

Truck, Telescopic, Tier-Lift

Wright-Hibbard Industrial Electric Truck Co., Inc., Phelps, N. Y. [Vol.73,p.413.] 182.

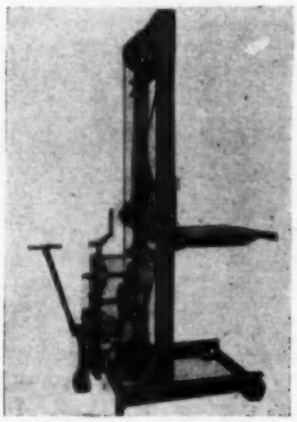
A telescopic tier-lift truck capable of lifting up to and including a height of 15 ft. has been developed. It is designed to be run through doorways of

normal height. By means of remote control the operator can ride on the platform and load or unload material. This truck can be supplied with various platform sizes and various heights in the lowered position.

Stacker, Gas-Engine-Driven

Lewis-Shepard Co., Watertown Station, Boston, Mass. [Vol.73,p.911.] 418.

This combination gas-engine-driven and hand-power stacker is operated by a compact 2½- to 3-hp., air-cooled, four-cycle en-



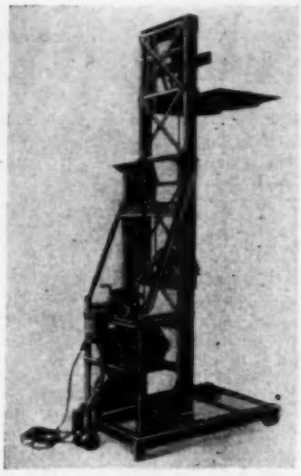
gine, and will lift a 1,000 lb. load at 40 ft. per minute. Lowering is taken care of by means of a decelerator control. The stacker is of value for tiering and storing material.

Tiering Machines, Ball-Bearing

Economy Engineering Co., 2653 West Van Buren St., Chicago, Ill. [Vol.73,p.1026.] 462.

Both hand and power operated, plain and telescoping tiering machines have been placed on the market. Ball bearings are used throughout. In the hand power type a cranking pressure of 25 lb. is required to lift the rated load. In the electric models, the greater efficiency resulting from the use of ball bearings has been employed to provide faster travel of the platform.

Spur-geared hoisting units

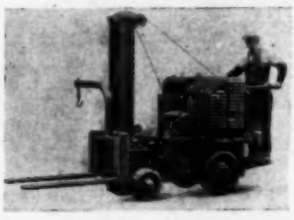


are used exclusively. Electric machines are equipped with high-torque motors of ¼, 1, 2 and 3 hp. Automatic limit stops prevent overtravel of the platform.

Tiering Trucks, Lift and Skid, Electric

Elwell-Parker Electric Co., Cleveland, Ohio. [Vol.73,p.1027.] 463.

The electric lift truck illustrated employs two heavy steel forks for getting under skids. It is particularly suited for pick-



ing up loaded skids and tiering them three skids high. A swivel boom with a capacity of 2,000 lb. is built in to provide means for swinging a heavy piece into the machine or to carry it suspended from place to place.

Tiering Truck, 3,000-Lb.

Elwell-Parker Electric Co., Cleveland, Ohio. [Vol.73,p.1028.] 464.

This tiering truck has a capacity of 3,000 lb. and is but 29 in. wide. The 18x7-in. platform will lift a 24 to 30 in. x

48 in. skid or container to a height of 63 in. The over-all height is 83 in. to clear a 7-ft. doorway. Safety features as found in larger sizes are also employed in this small model. Lifting is effected by a worm-gear speed reduction to cables that elevate the cantilever platform. The truck may be fitted with battery or gas-electric drive.

Skid Box, Four-Way

Powell Pressed Steel Co., Hubbard, Ohio. [Vol.73,p.457.] 127.

A four-way skid box has been developed especially for railway use. The legs are constructed of heavy angles and have a patented reinforcing frame, which provides a box-type construction. To eliminate catch-

ing in the floors, a stamping with round edges has been arc welded to the bottom leg, acting as a shoe and allowing the box to be moved easily. Both the sides and bottom of the box are made of 12-gage corrugated steel.

Rack, Tote-Pan, Visible, Steel

Powell Pressed Steel Co., Hubbard, Ohio. [Vol.73,p.536.] 114.

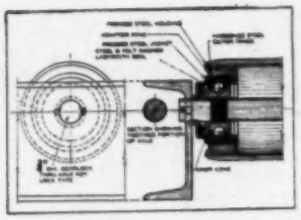
Convenient storage and inspection of parts can be effected by means of this visible steel

tote-pan rack. This rack may be built in any length or height required and employs the unit plan.

Conveyor Roller, Heavy-Duty

Mathews Conveyor Co., Ellwood City, Pa. [Vol.73,p.800.]

A feature of the roller is a gearlock made possible through gear teeth on the cone and knurling on the axle of the conveyor. The lock eliminates the turning of bearing on the axle. Clogging of the conveyor is eliminated by protecting all bearings with a special steel and felt washer labyrinth. These bearings can be packed with grease or furnished with lubrication fittings. Another feature is that one end of the axle is provided with an upset key, fitting into a corresponding slot in the frame rail. This



prevents the axle from turning. The opposite end of the axle has a standard cotter key lock.

Polishing Equipment

Buffer and Polisher, Model 95

United States Electrical Tool Co., Cincinnati, Ohio. [Vol.73, p.33.] 9.

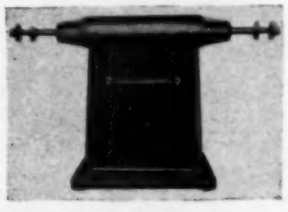
Five sizes of the Model 95 buffer and polisher—1, 2, 3, 5, and 7½-hp.—are being manufactured. Four heavy-duty SKF ball bearings inclosed in dust-

proof housings support the chrome manganese steel spindle. All buffers are equipped with remote control located in the base. Acme threads and bronze nuts are furnished on the spindle.

Buffer, Variable-Speed

Black & Decker Co., Towson, Md. [Vol.73,p.718.] 318.

Spindle speeds from 2,000 to 3,000 r.p.m. are available, and these selective speeds are obtainable by quick-change pulleys applied to the shaft of motor located in the base. The

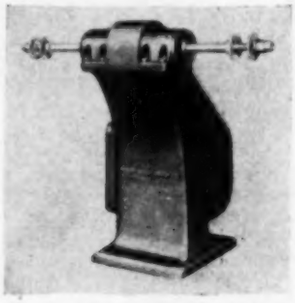


buffing heads are each driven with two cog belts, and either head may be stopped at will by means of clutches, one for each spindle. The spindles have automatic brakes. Spindle locks, ordinarily unnecessary, can be obtained at additional cost. The machine base is a heavy one-piece casting, and the ball-bearing type motor is carried on a removable steel plate at the rear.

Buffer, Texdrive, Model M

Hisey-Wolf Machine Co., Cincinnati, Ohio. [Vol.73,p. 1017.] 486.

Open-type spindle extensions are now available on the Hisey Model M Texdrive buffer on the 3, 5 and 7½-hp. sizes. The spindle and buffing wheels extend out from the base of the machine, permitting easy



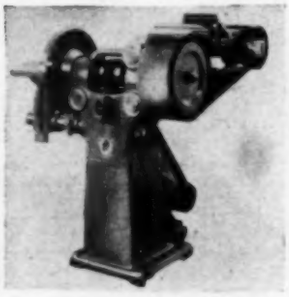
handling of large or odd-shaped pieces. The distance between the inner spindle nut and the housing of the machine is 12 in. in all cases on both sides, while the over-all length is 48 in.

Polishing Machine, Belt, Type D

Production Machine Co., Greenfield, Mass. [Vol.73,p. 759.] 342.

Work ordinarily polished against a buffing wheel can be polished on the Type D belt finishing machine. It is claimed to cut better and produce a superior finish.

The cushion wheel is made up of a cast-iron hub supporting



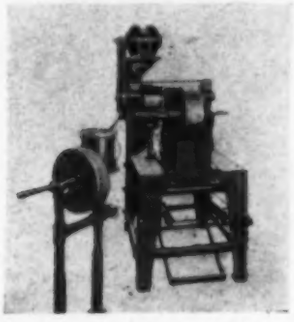
two steel flanges fitted with approximately 225 leather blades attached to metal holding pieces. A cloth abrasive belt running at 5,340 ft. per min. passes over this wheel.

Specifications: Cushion wheel, 17 in. diameter, 6 in. face; power required, for double machine, 5 hp., for single machine, 3 hp.; floor space required, 39 in. x 4 ft. 6 in.; abrasive belt, 6 in. wide x 9 ft. 10 in.

Polishing Wheel Set-up Machine

General Spring Bumper Corporation, Detroit, Mich. [Vol. 73,p.31.] 5.

The operator puts the wheels to be coated with polishing grains on the arbor, which is placed on the gluing stand close to the machine. The wheel is turned slowly while the glue is applied and then snapped into the spring clutches on the rocker arms, and the wheel pounded into the warm emery until an even, tough coating is obtained. While the machine is running, the operator glues another wheel. Machine-prepared wheels have more than 20 per cent increased productivity. Various sizes of wheels may

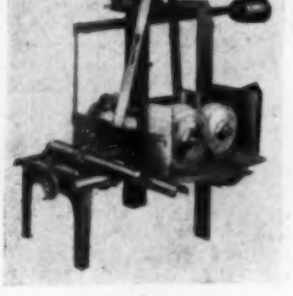


be set up, varying from 5 to 20 in. in diameter and up to 7 in. in width.

Truing Machine, Polishing-Wheel-Surface, No. 97

Excelsior Tool & Machine Co., East St. Louis, Ill. [Vol. 73,p.569.] 260.

Felt, leather, or fabric buff wheels can be trued to any shape. The dust hood is of



heavy sheet metal. The top is provided with a 10x10-in., sliding, non-breakable glass cover. Spindles are driven by an endless belt from a 7½-hp. motor. The polishing wheel spindle has a side oscillation movement of 2 in. to retain the straight surface of both grinding and polishing wheels.

The standard machine will take 16x6-in. face wheels.

Floor space, 6x6 ft.; weight, 2,300 lb.

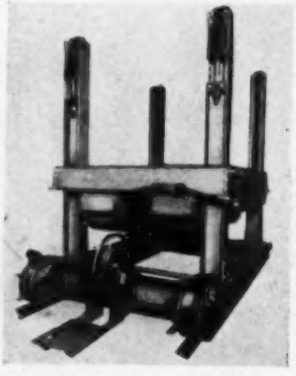
Railroad Equipment

Crosshead and Pin Ejector, Hydraulic, "Shaffer-Watson-Stillman"

Watson-Stillman Co., 75 West St., New York, N. Y. [Vol.73,p.33.] 6.

Prevention of upsetting, bending, or distorting of locomotive wrist pins is claimed for the "Shaffer-Watson-Stillman" hydraulic crosshead pin ejector. It is a self-contained, portable

unit. Two special hook rods are furnished, one shaped for the piston rod, and one having double horns for gripping the connecting rod. The pump is of the single-plunger type. Capacity of the device is 60 tons.



pinions from a single lever. The lifting table is a self-contained assembly, which hoists and lowers itself on the four flat wire rope cables guided by the four H-columns. The worm gear reductions are of the self-locking type so that the load cannot overhaul.

Drop Pit Table, Electric

Shaw Crane Works of Manning, Maxwell & Moore, Inc., Pershing Square Bldg., 100 E. 42d St., New York City. [Vol.73,p.414.] 185.

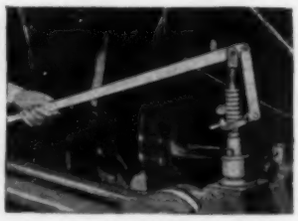
Wire rope hoists are employed in the Shaw electric drop pit table. This equipment is built in standard capacities of 30 and 50 tons, and in both movable and stationary types. The electrical equipment features an automatic magnetic brake on the hoist motor shaft, preventing drift when power is shut off and facilitating accurate spotting at the top lift. Over travel of the hoist at both top and bottom limits is prevented by limit switches.

The truck is an all-steel carriage with four H-beam columns for supporting and guiding the lift. Four massive horizontally sliding locking bars are provided on the table top, and all are operated by racks and

Grease Gun, Universal, "Spee-D"

Reliance Machine & Stamping Works, New Orleans, La. [Vol.73,p.264.] 98.

Pressures up to 5,000 lb. per sq.in. can be exerted and grease of hard consistency can be used with the "Spee-D" terminal gun. Locomotive con-



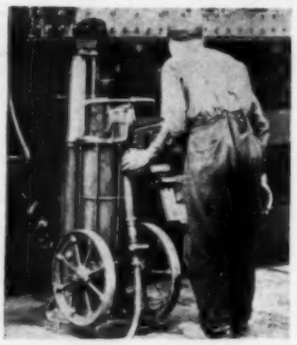
necting rod bearings are an application. The device functions with the connecting rod in any position.

The cylinder is designed to accommodate a convenient size of grease stick, 5 in. long. Standard "Spee-D" fittings or filler necks give a quick permanent connection.

Jack, Pneumatic-Hydraulic

C. C. Bradley & Son, Inc., Syracuse, N. Y. [Vol.73,p.182.] 57.

For use on locomotives, the "Johnson" jack is equipped with wheels and handles, and



can be moved quickly and easily by one man. When the jack is in operation, the wheels are up off the floor and the jack rests on a wide, cast-steel base.

An air hose is attached to the jack, and the air operates a single-acting air engine, which in turn actuates the small plunger of a powerful oil-operated hydraulic jack. The capacity is 80 tons. It cannot be lowered until the lowering valve is operated.

Jack, Power

Duff-Norton Manufacturing Co., Pittsburgh, Pa. [Vol.73,p.223.] 79.

Air-motor-operated power jacks are available in capacities from 50 to 100 tons and heights of lift from 14 to 25 in. Such jacks are used in car repair shops and round houses and permit the lifting of locomotives.

An automatic shut-off device makes it impossible to run the lifting standard out of its shell.

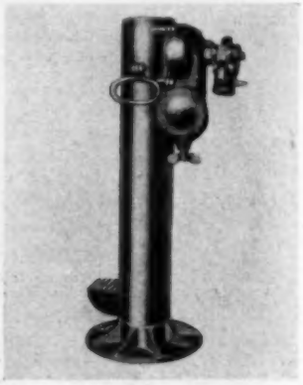
The standard is made of a steel tube and the load is carried on special bronze nut.

A patented valve mechanism controls the forward and reverse speeds of the air motor. With the use of a Y-connection, two jacks can be operated by one man. All important parts are mounted on annular ball bearings.

Jack, Empty-Car, No. 2819

Duff-Norton Manufacturing Co., Pittsburgh, Pa. [Vol.73,p.262.] 78.

Speedy and safe action are characteristics of this governor-controlled, self-lowering jack for empty-car work. Among the features are: a one-piece shell; easy operation by one man; safe, fast lowering by means of the thumbscrew lock; uniform lowering assured when two or more of these jacks are



used under the same load; and a footlift. The height is 28 in.; elevation of the head, 17 in.; diameter at the base, 10 in.; diameter of head, 4¾ in.; and weight, 109 lb.

Piston-Rod Pusher, Hydraulic, for Locomotives

Messinger Bearings, Inc., D St., above Erie Ave., Philadelphia, Pa. [Vol.73,p.224.] 71.

This piston-rod pusher weighs only 63 lb. It will effect the desired separation of the two members, crosshead and piston rod, without inflicting injury to either element. Oil pumped by hand stroking is delivered into the cylinder until a pressure of 300,000 lb. is developed for forc-

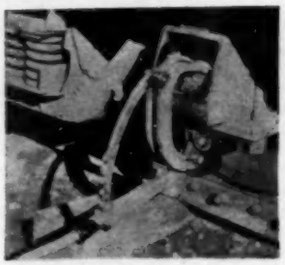
ing a hardened steel ram against the exposed end of the piston rod. The reaction is taken directly against the surface of the cross-head pin and bushings.

The dimensions of the mechanism are: length, 21¼ in.; height, 6½ in.; width, 3⅛ in. A set of four bushings is supplied.

Journal-Box Lifter, Suspension, No. 1005

Joyce-Gridland Co., Dayton, Ohio. [Vol.73,p.220.] 56.

This tool lifts the box on an empty car in two seconds with one down stroke of the lever. The box is lowered after inspection with one up stroke of the lever after releasing the safety

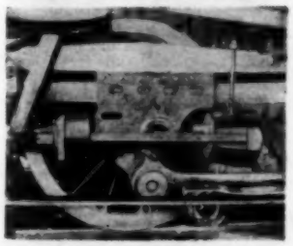


catch. One man can perform this operation. The jaws of the suspension-type jack are adjustable to fit over the collars of all standard size axles. The weight of the device is 40 lb.

Piston Kicker, "Watson-Stillman-Hollowell"

Watson-Stillman Co., 75 West St., New York, N. Y. [Vol.73,p.648.] 177.

When removing piston rods from crossheads, the "Watson-Stillman-Hollowell" piston kicker is attached to the locomotive frame. Hydraulic pressure is supplied by a hand pump

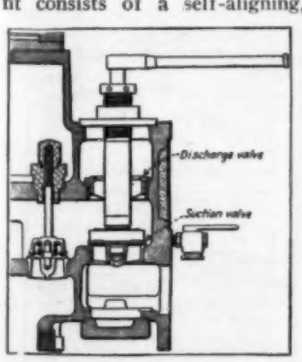


and separates the piston rod from the crosshead without marring the fit or cracking the crosshead. A pressure of 125 tons is developed. A specially designed elevating and tilting buggy, not shown, is also furnished.

Reseating Outfit, Dexter Valve, for Worthington Feedwater Heaters

The Leavitt Machine Co., Orange, Mass. [Vol.73,p.181.]

This outfit is for refacing the seats of discharge and suction valves in Worthington locomotive feed-water heaters. The outfit is portable and valves are resurfaced in place. The outfit consists of a self-aligning,



non-chattering cutter driven by a spindle inside a sleeve and centered by a clamp. The cutter is centered at the bottom by means of a pilot. The cutter is operated by a ratchet handle.

The equipment is adaptable to both the Worthington BL heater and to the hot-water pumps of the Type S equipment.

Reseating Outfit, Dexter Valve, for "Elesco" Exhaust Steam Injector

The Leavitt Machine Co., Orange, Mass. [Vol.73,p.186.] 48.

A portable set of tools, for refacing and recessing the various valve seats in the "Elesco" exhaust steam injec-

tor used on locomotives, comprises the "Dexter" valve reseating outfit.

An outfit includes a machine head, which is attached to the valve opening by rotating the jaws of the chuck. A bearing sleeve supports the tool spindle for practically its entire length. The spindle is rotated by ratchet handle. Two sets of cutters are provided: a set of flat cutters for refacing the seats, and a set of cutters for recessing them.

Headlight Tester, Type HTD

Roller-Smith Co., 233 Broadway, New York, N. Y. [Vol. 73,p.497.] 171.

The tester consists of a d'Arsonval mechanism enclosed in a heavy sheet-metal case. The 2: 1-in. scale is read through

a narrow sector-shaped opening. Two sizes are available, the first with a range of from 0 to 50 volts, and the second a double-range size with ranges from 0 to 50 and 0 to 500 volts.

Dimensions are 4½x3x1½ in.

Transmission Equipment

Speed Reducers, Westinghouse-Nuttall, Types Sh and DH

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.181.] 51.

These units are of non-planetary design, with shafts arranged in the horizontal plane, and have either right- or left-

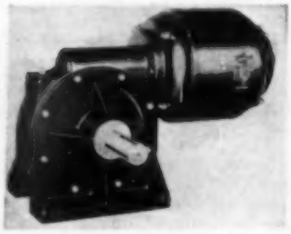
hand assembly, as desired. Both types are made in twelve sizes, providing a total of 28 standard reduction ratios ranging from 2.82 to 1 to 70.5 to 1, and having capacities of 1 to 635 hp.

Westinghouse-Nuttall single-helical gearing has been adopted as standard for these units. A single Timken bearing is used at each end of all high-speed and intermediate shafts. On low-speed shafts a Hyatt bearing is used at the extension end and a double Timken bearing at the closed end. Bedplates of welded steel construction, with or without supports for outboard bearings, are available for all sizes.

Speed Reducer, Motor-Driven, Type RW-2

Janette Manufacturing Co., 556 W. Monroe St., Chicago, Ill. [Vol.73,p.454.] 201.

The gear housing bolts directly to a machined pad on the end frame of the motor. The gearbox itself is divided into three parts, the main housing and two sides. These two sides, to which the mounting feet are



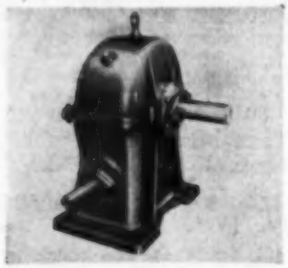
cast, can be shifted in relation to the fixed main housing, thus enabling the speed reducer to be mounted either on the floor, wall, or ceiling. Either a right- or a left-hand shaft extension can be supplied.

The speed reducer is available with ratios of 50, 60, 70, 90, or 100 to 1, and with motors of ½, ¾, or 1 hp.

Speed Reducer, Right-Angle Drive, Type TF

Boston Gear Works Sales Co., North Quincy, Mass. [Vol. 73,p.566.] 194.

These reducers are available from stock in sizes up to 20 hp. and in ratios from 15½ to 1 up to 80 to 1. The construction is similar to the other "T"



types, consisting of a phosphor-bronze gear operating with a hardened and ground steel worm. Shafts are mounted on Timken bearings.

Speed Reducers, Small

Winfield H. Smith, Inc., Springville, N. Y. [Vol.73,p. 647.] 295.

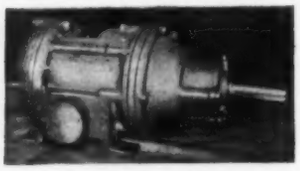
Small reduction gears for use with ¼-hp. motors have been placed on the market in the Nos. 2B and 3B types. These models employ anti-friction bearings throughout. The model 2B can be furnished with ratios

of 48 to 1 and 30 to 1, and the No. 3B in ratios of 20 to 1, 10 to 1, and 5 to 1. Another model is the No. 2DB, which can be furnished with ratios of 400 to 1,200 to 1, and 100 to 1. It has a double-worm-gear drive, capable of transmitting a torque of 150 in.-lb. Radial thrust ball bearings are used on high-speed shafts, ball thrust on intermediates, plain on low.

Speed Reducer, Motorized

Production Equipment Co., 5310 Windsor Ave., Cleveland, Ohio. [Vol.73,p.797.] 366.

Motorized speed reducers in capacities up to and including 20 hp. are available in compact units, consisting of a standard heavy-duty electric motor with



an integral planetary gear reduction unit mounted in an oil-tight casing. Motors can be supplied in a single-speed, multi-speed, enclosed, and high-torque designs for either horizontal or vertical mounting. Final shaft speeds of 50 to 550 r.p.m. can be obtained.

Transmission, Variable-Speed, "P.I.V."

Link-Belt Co., Philadelphia, Pa. [Vol.73,p.829.] 387.

Basically, the unit consists of two pairs of wheels of the opposed conical disk type, between which a unique chain transmits power. The effective diameters of each pair of wheels can be altered under load to change the speed ratio, without steps and without dependence upon friction. Radial teeth are cut in the conical faces of the driving disks.

The chain is made up of a series of steel leaves or links. What may be called teeth are

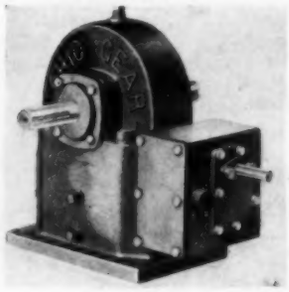
made up of packs of hardened-steel laminations or slats which extend through slots in the links at right angles to them, and project about ¼ in. at each side of the chain. The slats are free to slide from side to side individually.

Movement of the pairs of wheels together or apart is controlled by a pair of pivoted levers.

Speed Reducer, Worm Gear, With 4-Speed Gear Shift

Ohio Gear Co., 1333 East 179th St., Cleveland, Ohio. [Vol.73,p.946.]

By means of a selective dial, any one of four speeds can be obtained from this worm-

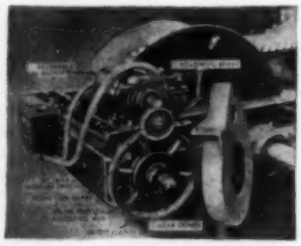


gear speed reducer. Sizes range from 3 hp. to fractional horsepower sizes of ¾ and ½ hp. The worm and worm wheel assembly provides the main reduction. The mechanism is so designed that the "gear shift" dial cannot be operated unless the unit is at rest. Both the box and worm assembly can be arranged for any operating position specified.

Controls for Reeves Variable-Speed Transmission, Electric, Automatic and Remote

Reeves Pulley Co., Columbus, Ind. [Vol.73,p.455.] 113.

Automatic regulation of the output speeds of the Reeves variable-speed transmission can be regulated infinitely over a predetermined range by means of the electric automatic control. Any number of machines may be installed in tandem or



in range, and the speeds synchronized automatically.

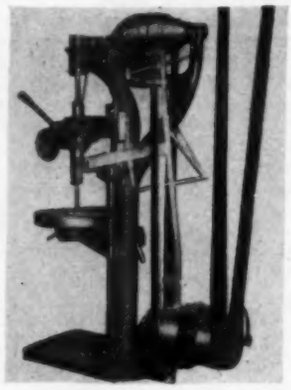
The Reeves electric automatic control functions automatically to obtain any required speed by means of a follower roll, floating roll, or some sensitive moving part of the machine to be regulated. A two-way mercury switch for running the reversible motor either clockwise or counter-clockwise is provided.

Remote control permits the operator to change and regulate the speed of one or more machines without leaving his position.

Belt Shifter

United States Tool & Machine Works, 27 Thames St., New York, N. Y. [Vol.73,p.497.] 187.

A cone belt shifter permitting easy shifting by the operator from the front of the machine, has been placed on the market. This device has two pairs of



brackets at each end of a long vertical bent rod. These brackets encircle the belt and force it to move from one step to another. The shifting handle projects out at the front of the machine.

Chain Drives, Roller

Diamond Chain & Manufacturing Co., Indianapolis, Ind. [Vol.73,p.185.] 55.

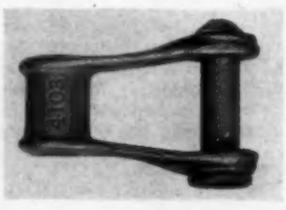
Chain drives for all standard power application are now being stocked by the above concern. The drive consists of a roller chain and two sprockets ready

to be installed. Chain drives in single to quadruple strands, from ¼ to 75 hp., and in ratios up to 8.4 to 1 and for motor speeds up to 1,750 r.p.m., are available.

Chain, "Promal"

Link-Belt Co., Indianapolis, Ind. [Vol.73,p.259.] 28.

A line of cast chain showing greater strength and durability than malleable chain has been placed on the market. This chain is sold under the trade name of "Promal." It is especially suitable for operating under heavy loads and abrasive conditions. In addition, "Promal" is tough and ductile so that it withstands shock and fatigue loads. Temperatures up to



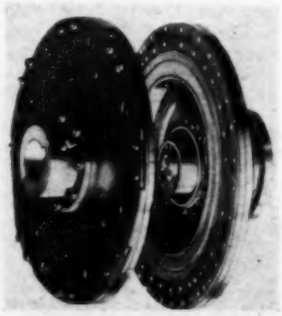
1,000 deg. F. will not cause it to become brittle.

"Promal" chain is recommended for: (1) chain drives, elevators and conveyors, (2) chain drives where greater strength is required than that of malleable chain, (3) drag, scraper, and flight conveyors, and (4) heavy-duty drives at high speeds, short centers, and large sprocket ratios.

Clutch, Magnetic, Type L

Cutler-Hammer, Inc., 80 West 12th St., Milwaukee, Wis. [Vol.73,p.456.] 192.

More consistent operating characteristics, easier installation, greater safety, and easier access to parts that may have to be renewed are among the claims made for the Type L magnetic clutch. The armature cross-section is L-shaped, so



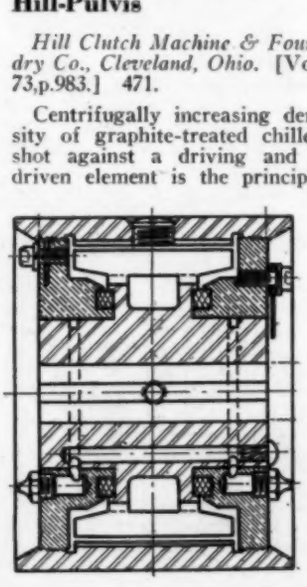
that it fits around the magnet coil. This gives a greater and more steady magnetic pull. The magnetic coil is removable.

A centering roller bearing, mounted in the field member, protrudes so that it fits into a recess in the armature hub and forms a common support for both clutch members, but permits either member to revolve independently of the other when disengaged.

Clutch, Centrifugal, Hill-Pulvis

Hill Clutch Machine & Foundry Co., Cleveland, Ohio. [Vol. 73,p.983.] 471.

Centrifugally increasing density of graphite-treated chilled shot against a driving and a driven element is the principle



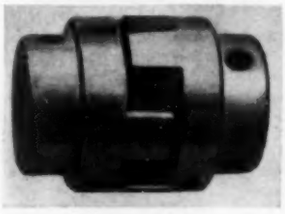
employed in the Hill-Pulvis clutch. This type of clutch can be applied to individual drives, either as a motor pulley, V-belt sheave, gear or sprocket, or as a coupling on direct-connected drives.

The winged wheel turns at the motor or shaft speed and rotates the charge of chilled shot. The rotating rotor wings set up centrifugal action, forcing chilled shot out against the serrated inner surface of the shell. The chilled shot mass packs tightly and assumes a definite position in front of each wing. Every clutch is equipped with a "tell-tale" device that indicates duration of starting time and shows overloading.

Coupling, Flexible, "L-R"

Lovejoy Tool Works, 325 West Ohio St., Chicago, Ill. [Vol.73,p.833.] 351.

The "L-R" Multiflex resilient spider, which forms the driving medium between the halves of the coupling, is made up of a number of thin layers of highly resilient rubber vulcanized between layers of wear-resisting



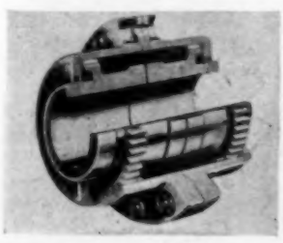
fabric. Spiders can also be furnished in laminated leather, wool-felt, molded rubber, fiber, and various other materials.

Type A couplings for light machinery have standard stock bores from ¼ to ⅜ in., carrying loads from 0.25 to 0.75 hp. at 100 r.p.m. Large couplings for heavy machinery are available with bores from ½ to 3 in. and capacities up to 30 hp. at 100 r.p.m.

Couplings, Flexible, Medium and Light Duty

Poole Engineering & Machine Co., Baltimore, Md. [Vol.73,p.833.] 378.

Features of the heavy-duty mill type flexible coupling manufactured by the concern also are found in the medium-duty coupling. The construction is of the geared type, and the



coupling will compensate for angular and off-set misalignment.

The coupling is available in three bores, 1, 1½ and 2 in., having capacities at 100 r.p.m. of 3, 8 and 20 hp. Maximum speeds for these three couplings are 7,500, 6,000, and 5,000 r.p.m.

Gears, Die-Cast, Stock, "Doehler-Boston"

Boston Gear Works Sales Co., North Quincy, Mass. [Vol. 73,p.796.] 362.

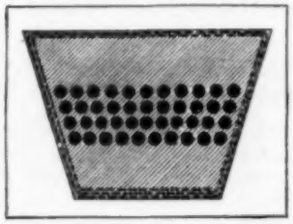
Through an arrangement with the Doehler Die Casting Company, die-cast stock gears are now distributed exclusively under the name of "Doehler-Boston" die-cast stock gears by the above concern. All of these stock gears are cadmium plated to eliminate corrosion.

The line consists of 14½-deg. spur gears from 12 to 48 pitch, the largest pitch diameter being 10 in., the smallest, 5/24 in. Miter gears, bevel gears, and 14½-deg. spur gear racks are also available.

Multi-V-Drive

Worthington Pump & Machinery Corporation, Harrison, N. J. [Vol.73,p.70.] 20.

A "Multi-V-Drive," developed in conjunction with the Goodyear Tire & Rubber Company, has been placed on the market. It combines a rubberized cord V-belt with an improved V-grooved sheave. The load-carrying members are high-grade cotton cords arranged in



parallel lines and concentrated about the neutral axis. Among the claims made for this belt are: high power capacity, long flexing life, low stretch, accurate cross-section, and high-quality rubber.

Transmission of about 99 per cent of the applied power is claimed at high speed ratios, over short centers.

V-Belt Drives

The Medart Co., 3500 DeKalb St., St. Louis, Mo. [Vol. 73,p.834.] 319.

V-belt drive units of all standard designs and speeds can now be furnished. Sheaves are available in pitch diameters from 4 to 96 in., and with from 1 to 12 grooves. Medart V-belt cross-sections range from ½x½ in. to 1¼x1 in.

Welding Equipment

Welder, Gas-Powered, "Trucwelder"

Clark Tructractor Co., Battle Creek, Mich. [Vol.73,p.183.]

This "Trucwelder" is a complete, mobile, self-contained, gas-powered, electric arc-welding unit, capable of 24-hours continuous operation. Arc-welding current, ranging from

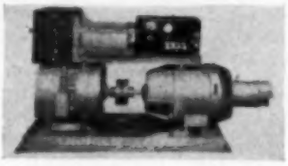
60 to 250 amp., at 25 volts, is developed by a self-excited arc-welding generator with control, driven by a special, heavy-duty, 4-cylinder gas engine developing 20 hp. at 1,480 r.p.m. Amperages between 25 and 60 amp. may also be obtained. Commercial sizes of metallic electrodes from 1/16 to 5/16 in. in diameter can be used.

Automatic stabilization of the welding arc is provided for by a self-adjusting arc stabilizing reactor. For striking the arc, a high open circuit voltage of 65 volts is available.

Welder, 600-Amp.

Lincoln Electric Co., Cleveland, Ohio. [Vol.73,p.226.] 68.

High welding current for use with large size metallic and carbon electrodes can be obtained from this 600-amp. welder. The welder is also used to supply current for the "Electronic



Tornado." The model may be had in either a portable truck type or a stationary truck type, and is a motor-driven, single-operator, variable-voltage machine. Current range is from 180 to 750 amp.

Motor and generator are direct connected. All controls are contained in a ventilated, inclosed steel cabinet.

Welder, Gas-Engine-Driven, 400-Amp., "Stable-Arc"

Lincoln Electric Co., Cleveland, Ohio. [Vol.73,p.375.] 156.

Current range of this model runs up to 500 amp. It is of the variable-voltage, single-

operator type, operating at 1,500 r.p.m. All controls are contained in a ventilated, inclosed steel cabinet.

The welder is driven by a six-cylinder engine with an S.A.E. rating of 33.75 hp. and a brake horsepower at 1,500 r.p.m. of 55. An automatic throttle control permits the engine to idle at about half speed.

Wheels are optional. Overall dimensions, exclusive of wheels, are 104x32x58 in. and the weight is approximately 3,500 lb.

Welding Equipment, Arc, Improved, "Dualarc"

Electric Arc Cutting & Welding Co., 152 Jelliff Ave., Newark, N. J. [Vol.73,p.532.] 226.

Improved "Dualarc" arc-welding equipment in both motor-generator sets and gasoline-engine driven models are

now available. These machines employ the two-arc arrangement, which does away with unbalancing. Each generator can be controlled separately to meet the arc requirements of two operators working simultaneously, or the two generators can be put in series to obtain high voltage for cutting or for carbon-arc work. A full 600-amp. current is produced.

Welder, Semi-Automatic, for the Shielded Arc

General Electric Co., Schenectady, N. Y. [Vol,73,p.572.] 251.

This improved, portable, semi-automatic arc-welding equipment can be used for either open or shielded arc welding. Equipment consists of a welding head for feeding the elec-

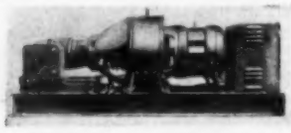
trode, an inclosed line contactor with interlock, a field rheostat for controlling the motor on the welding head, and a welding tool and lead for directing the electrode toward the work.

The rate of electrode feed can be adjusted for various sizes of wire to $\frac{3}{32}$ in.

Welder, 600-Amp.

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.801.] 358.

This machine is designed to handle various sizes of electrodes, including bare and special-coated rods requiring current values up to 750 amp. Either electric-motor or gaso-



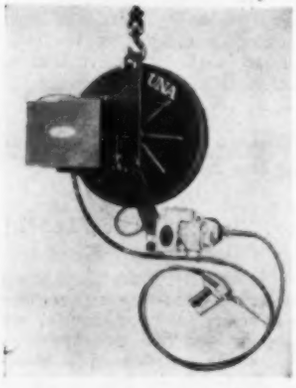
line-engine-driven models in stationary or portable types are available. The "Flexactor" provides non-surge welding circuit and arc stabilization. Control apparatus is inclosed in a sheet-metal cabinet.

Over-all dimensions of the stationary motor-driven unit illustrated are 96x28x40 in., and the weight is approximately 4,500 lb.

Welding Unit, Semi-Automatic, "Una-Goodspeed"

Una Welding & Bonding Co., Cleveland, Ohio. [Vol.73,p.725.] 310.

Portability of the "Una-Goodspeed" semi-automatic welding unit permits its use on unrestricted application of arc-welded work. The arc length is maintained within very close limits. Continuous seams are



made without interruptions for changing electrodes.

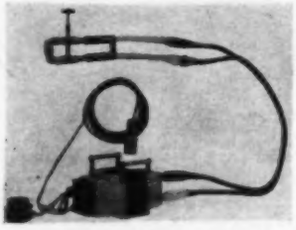
The "Una-Goodspeed" welding unit is suspended anywhere in the shop on a hoist hook. The head is driven by compressed air. A minimum air pressure of 70 lb. per sq.in. may be used.

On leaving the head, the welding rod passes through a flexible steel tube equipped with a pistol grip handle and carrying a trigger finger control for both operating and welding circuits.

Brazing Equipment, Resistance-Type

General Electric Co., Schenectady, N. Y. [Vol.73,p.337.] 116.

Brazing with this equipment is caused by the heat generated by the flow of electricity through carbon blocks. Equipment consists of a transformer, foot switch, and tongs for hold-



ing the carbon blocks and work. A typical equipment involves a 5-kva. transformer having a 220-volt primary and an 8-volt secondary.

Parts to be brazed are designed with flat surfaces or are flattened before brazing. Advantages claimed for this method over soldering include less time, less expense, and greater strength.

Electrodes, Welding, "Flex-Arc"

Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pa. [Vol.73,p.261.] 104.

Reduced metal spattering is effected by the use of these "Flex-Arc" electrodes. Both vertical and overhead welding may be done. Weld strengths range from 55,000 to 60,000 lb. per sq.in.

"Flex-Arc" dull-coated and bright-coated electrodes are manufactured from basic open-hearth steel, and are packed in standard 50-lb. bundles. They are available in the following sizes: $\frac{1}{16}$, $\frac{3}{32}$, $\frac{1}{8}$, $\frac{5}{32}$, $\frac{3}{16}$, and $\frac{1}{4}$ in.

Wire, Arc-Welding, "Red-Processed"

Wilson Welder & Metals Co., Inc., P.O. Box 96, North Bergen, N. J. [Vol.73,p.457.] 129.

A general-purpose rod, known as "Red Processed" arc-welding wire, has been announced. This wire combines fast and smooth flowing qualities with good penetration. It will produce a weld of at least 50,000 lb. per sq.in. tensile strength, and has medium ductility. It is supplied in 50-lb. bundles.

Welding Rod, Aluminum, No. 23

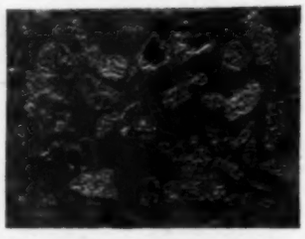
Oxweld Acetylene Co., 30 E. 42d St., New York, N. Y. [Vol.73,p.641.] 265.

Welding either aluminum sheet or castings with the metal held tightly in jigs can be done with this rod. The rod coalesces readily with all the aluminum alloys and possesses high strength and good corrosion resistance. It should always be used with Oxweld sheet aluminum flux. The rod is now available in three sizes, $\frac{1}{16}$, $\frac{1}{8}$, and $\frac{1}{4}$ in.

Electrode, Flux-Coated, "Borium"

Stoody Co., Whittier, Calif. [Vol.73,p.726.] 333.

Hard facings made with "Borium" flux-coated electrode contain unoxidized tungsten-carbide particles in a matrix of hard carbon steel. The electrode consists of a steel tube of flux-coated Borium. The ma-



terial is broken up into pea sizes and coated with a flux. When in the heat of the electric arc, the tungsten carbide is protected against oxidation.

Electrodes for Spot Welding, "Elkaloy"

Elkon, Inc., Div. of P. R. Mallory & Co., Inc., Indianapolis, Ind. [Vol.73,p.907.] 404.

For use on manual spot welders, an electrode material known as "Elkaloy" has been developed. This material is approximately 40 per cent harder than the hardest drawn copper, and lasts from three to five times as long. It requires fewer redressings and makes more uniform welds. It successfully welds scaly iron, galvanized iron, cadmium-plated metals, terne plate, and other coated metals.

Electrode Holder

Stoody Co., Whittier, Calif. [Vol.73,p.187.] 41.

The complete holder weighs 17 oz., but is constructed of steel forgings with a turned composition fiber handle. The jaws, which hold the electrode, are corrugated. Any electrode from $\frac{1}{8}$ to $\frac{1}{4}$ in. or more in

diameter can be held by the same tension. This holder is designed with narrow jaws, which permit using the electrode up to less than $1\frac{1}{2}$ in. in length.

Electrode Holder, Improved, Type A, "Meco"

Modern Engineering Co., 3411 Pine Blvd., St. Louis, Mo. [Vol.73,p.906.] 431.

Electrodes from $\frac{1}{16}$ to $\frac{1}{4}$ in. can be used on the Type A "Meco" electrode holder. This device has a so-called "Bull-dog" electrode grip, having ser-

rated teeth on both jaws of the holder. A heat-resisting alloy steel spring provides the necessary clamping pressure.

Regulator, Rego, "Red Star"

The Bastian-Blessing Co., 241 E. Ontario St., Chicago, Ill. [Vol.73,p.70.] 32.

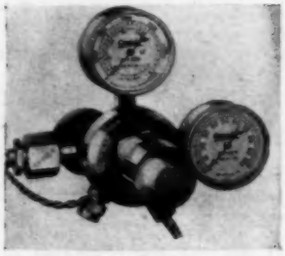
Balancing of the action of the first and second stages and the use of large-size diaphragms for both stages are features of

the "Red Star" regulator. The first stage is a complete regulator functioning at any desired pressure.

Regulator, Oxygen, Two-Stage

Oxweld Acetylene Co., 30 East 42d St., New York, N. Y. [Vol.73,p.493.] 202.

Constant welding line pressure is given by this two-stage oxygen regulator. This two-

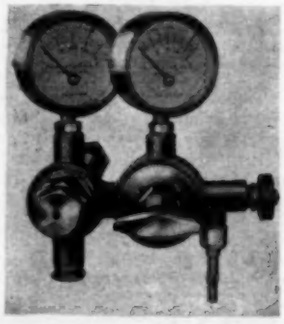


stage reduction is accomplished through two separate and independent sets of diaphragms, valves and springs.

Regulators, Welding-Gas, High and Low Pressure, "Messer"

Jos. C. Paulus & Co., 2507 Potter St., Philadelphia, Pa. [Vol.73,p.648.] 272.

High-pressure oxygen regulators are available for cutting from 4- to 24-in. metal. Low-pressure regulators are available for use on all welding or cutting from ¼ up to 4 in.



Acetylene regulators are available for all welding work and for cutting from ¼ up to 12 in. Cutting from 12 to 24 in. can be controlled by high-pressure hydrogen regulators. The low-pressure models are for use on all welding or cutting work.

Torches, Welding and Cutting

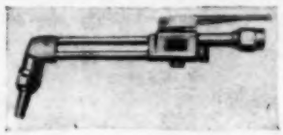
Jos. C. Paulus & Co., 2507 Potter St., Philadelphia, Pa. [Vol.73,p.497.] 198.

The complete welding and cutting outfit is for welding from ⅛ up to 1¼ in., and cutting from ¼ up to 12 in. The torches are as follows: a cutting head for straight or bevel cutting; a welding head attached to a universal shaft; a piercing head for cutting round holes from ⅜ to 3 in. in metal from ⅛ to 1 in. in thickness; a boiler-tube cutting head for tubes from 1¼ in. up from the inside; a rivet-cutting head, and a brazing head.

Blowpipe Attachments

Oxweld Acetylene Co., 30 E. 42d St., New York, N. Y. [Vol.73,p.533.] 225.

Two accessories for the W-17 welding blowpipe make it capable of doing almost any type of work. The first, a cutting attachment, will cover a reasonably wide range of cutting



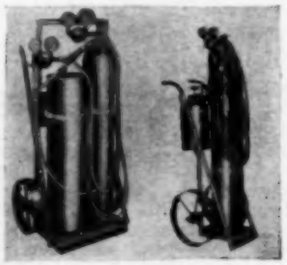
work. The heating flames may be regulated while the blowpipe is in operation. Two cutting nozzles are supplied.

The other accessory is the W-17 to W-15 adaptor, which makes it possible to use any of the welding heads available for the W-15 sheet-metal welding blowpipe with the W-17 welding blowpipe handle.

Torch, Metal-Cutting, Gasoline

Torchweld Equipment Co., Chicago, Ill. [Vol.73,p.609.] 258.

As compared with oxy-acetylene equipment, the gasoline metal-cutting torch weighs 220 lb. less, and will perform as much work with 2 gal. of gasoline as the larger equip-



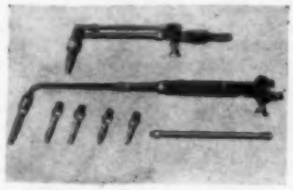
ment. Storage space for cylinders is eliminated, and the equipment may be transported readily.

The equipment consists of a cutting torch with four gasoline cutting tips, 25 ft. of high-pressure oxygen hose, 25 ft. of flexible, metallic, gasoline hose, a 2-gal. welded gasoline tank, a high-pressure, two-gage, oxygen-cylinder regulator; wrenches; goggles, and gloves.

Welding Torch, Type X, "Meco"

Modern Engineering Co., 4311 Pine Blvd., St. Louis, Mo. [Vol.73,p.899.] 432.

Lightness and balance have been incorporated in the design of the "Meco" Type X "Super" welding torch for general and

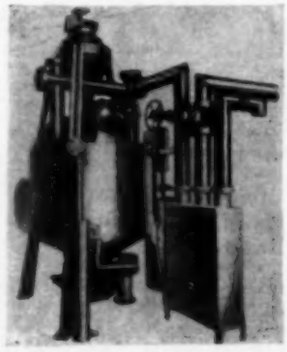


heavy welding. All types of torch accessories can be adapted to this unit. The torch has been designed to be non-flashing, at the same time being capable of producing a long neutral flame. The torch may be adapted to low pressure. All styles of cutting tips can be used.

Generators, Acetylene, Types NA-3 and NA-4

Oxweld Acetylene Co., 30 East 42d St., New York, N. Y. [Vol.73,p.265.] 100.

Two improved types of non-automatic, stationary acetylene generators for supplying large volumes of acetylene have been placed on the market. These generators are each made in



two sizes having 500-lb. and 1,000-lb. carbide capacity.

The Type NA-3 acetylene generator is for plants using low-pressure welding and cutting apparatus. It delivers gas to a storage holder maintaining a pressure of 20 in. of water. Carbide is conveyed from the hopper to the generating chamber by a rotary feed screw driven by a slow-speed reciprocating water motor. The carbide feed is not automatically governed by, or interlocked with, the immediate acetylene requirements.

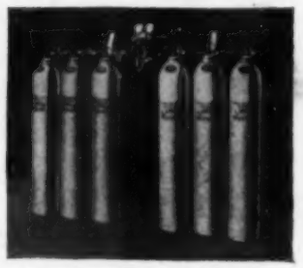
The Type NA-4 generator is similar to the NA-3, but has the addition of an "Oxweld" automatic booster system to deliver acetylene at pressures not above 15 lb. per sq.in.

Manifolds, Oxygen and Acetylene

Oxweld Acetylene Co., 30 East 42d St., New York, N. Y. [Vol.73,p.298.] 69.

To furnish small users of oxygen and acetylene with an economical means of gas distribution, two small capacity manifolds have been developed.

The 6-cylinder oxygen manifold is of the wall type. Three



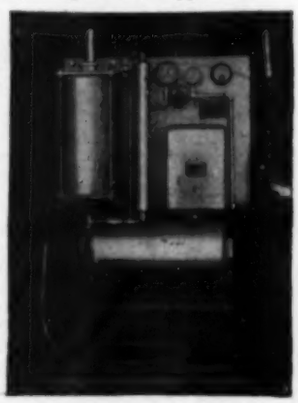
cylinders may be changed while three are maintaining the oxygen supply. The 4-cylinder acetylene manifold is also of the wall type. Each cylinder head is independent of the others. Each cylinder connection is fitted with the "Prest-O-Lite" flash arrestor.

Dissociation Equipment for Anhydrous Ammonia

General Electric Co., Schenectady, N. Y. [Vol.73,p.531.] 232.

Dissociation of anhydrous ammonia for use with atomic hydrogen welding equipment is possible with this dissociation equipment. Enough dissociated gas can be supplied per hour at atmospheric pressure and temperature to operate a ¼-in. electrode holder for current values up to 70 amp. Gas pressure at delivery does not exceed 10 lb. per sq.in. The electrical rating is 3.5 kw. at 220 volts, 60 cycles, a.c.

The dissociator consists of an electrically and thermally insulated alloy tube filled with an ammonia cracking catalyst and connected to a low-voltage, high-current transformer. Suitable temperature control and indicating devices, regulator, safety devices, and a heat interchanger are supplied.



Testing Machine, Weld, Tensile, Portable, "Oxweld"

The Oxweld Acetylene Co., 30 East 42nd St., New York, N. Y. [Vol.73,p.798.] 365.

This machine was originally described on page 858, Vol. 72, *American Machinist*. It weighs 165 lb. and measures 28 in. in over-all length by 6¾ in. in maximum diameter. It consists of a tubular compression member with a set of grips in the head and a hydraulic cylinder block in the base. The piston carries a second set of grips. A pump handle is moved back and forth to obtain the desired pull. A set of conical blocks can be substituted so that standard ½-in. round specimens may be tested. The load is measured directly in lb. per sq.in.

This machine makes it possible to secure a tensile test immediately after welds are made.

Woodworking Equipment

Bandsaw, Fabricated, All-Steel

DeWalt Products Corporation, Lancaster, Pa. [Vol.73,p. 1024.] 457.

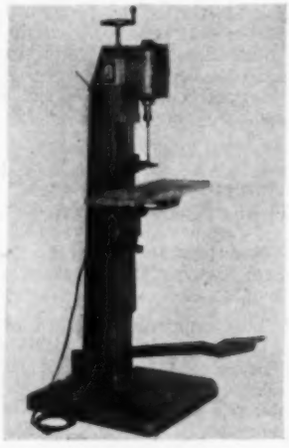
Built completely by electric welding, the DeWalt fabricated bandsaw is light in weight and of sturdy construction to eliminate vibration and to increase the service life of the blade. It

is manufactured in two types, a two-wheel unit and a three-wheel unit. The 16-in. machine has two wheels, whereas the 24 and 30-in. models are equipped with three wheels. The use of three pulley wheels makes possible greater throat clearance. Motors of ½ hp., ¾ hp., or 1 hp., with a V-type pulley and belt are furnished.

Boring Machine, for Wood, Single-Spindle, Portable, No. 194-B

Oliver Machinery Co., Grand Rapids, Mich. [Vol.73,p.180.] 33.

Holes up to ¾ in. in hardwood and up to 1½ in. diameter in soft wood by 4 in. deep can be bored on this tool. This machine is particularly suited to pattern shops. It bores to the center of pieces 8 in. wide. It is fitted with a plain wooden top table having vertical adjustment of 22 in., one ½-in. boring bit, and a ½-hp. motor. The hold-down is adjustable to any desired position and is mounted on a saddle.



Floor space of 24x28 in. is required.

Planers and Jointers, Hand, Ball-Bearing, No. 189

Oliver Machinery Co., Grand Rapids, Mich. [Vol.73,p.758.] 345.

Inclined-bed jointers are now built in 6-, 8- and 12-in. sizes. These jointers will handle work up to the full-rated capacity either with the fence square or tilted to 45 deg. Cuts up to ¾ in. thick can be made, and stock of almost any length can be jointed. Long tables are a feature of these machines, being 60 in. long by 9½ in. wide for the 8-in. jointer, and 72 in. long by 13 in. wide for the 12-in. jointer. They have a screw for

vertical adjustment. Both tables at the cutterhead are fitted with the removable steel angle throat pieces, making the throat opening the narrowest possible.

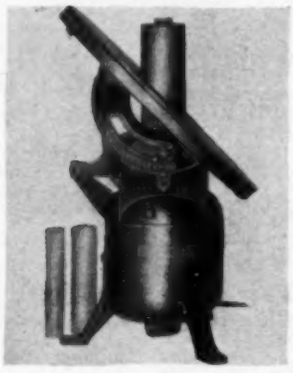
The cylinder cutterhead has a 3⅞ in. cutting diameter for the 8-in. jointer and 5-in. cutting diameter for the 12-in. jointer, each fitted with three high-speed steel knives. A one-piece cylinder yoke carries the cutterhead and shaft.

Sander, Spindle, Bench-Type, Oscillating, Type 0-4

The Porter-Cable-Hutchinson Machine Co., Syracuse, N. Y. [Vol.73,p.263.] 105.

The tool is especially useful on all small corebox patterns and does away with much hand gouging. In addition, cam pattern and gearcover work are simplified. The Type O-4 unit supersedes the Type O-3.

A ¼-hp. repulsion-induction motor is now used, and can be run on either 110 or 220 volts.

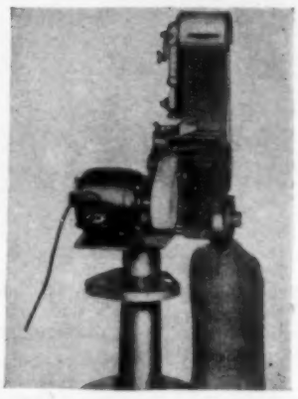


The table is supported by a segment which gives perfect centering, this segment being marked to 45 deg. The spindle oscillates 90 times per minute and has a ½-in. travel. It revolves at the motor speed, 1,725 r.p.m.

Sander and Grinder, Belt, Type B-9

Porter-Cable-Hutchinson Machine Co., Syracuse, N. Y. [Vol.73,p.415.] 173.

For quickly putting a straight grain finish on metal, wood, fiber, Bakelite, or other material, a belt sander has been developed. Other operations that can be performed are removing burrs, cleaning up castings, grinding bearing caps, replacing light milling operations, sharpening tools, polishing, and sanding. The Type B-9 sander has a two-speed arrangement. A vacuum dust-collecting system is built into the machine. The Type B-9 can be used in either a vertical or horizontal position as the work requires. For the horizontal position a special edging guide is provided. Compound angles can be secured by tilting.

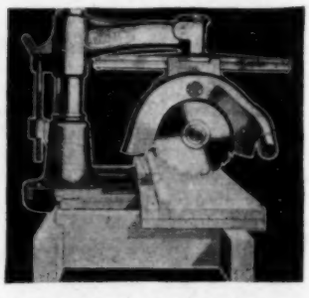


Specifications: Belt speeds, 3,000 and 4,000 ft. per minute; motor speed, 1,725 r.p.m.; abrasive belt, 6 in. wide x 54½ in. long; adjustable table, 6 in. x 7¼ in.; table height from floor, 40 in.; net weight, 260 lb.; hp. required, 1.

Saw, Bench-Type, "Multiplex"

Red Star Products Corporation, P.O. Station D, Cleveland, Ohio. [Vol.73,p.225.] 75.

Capable of making any cut except a bandsaw cut, the "Multiplex" saw is of the bench type. With the motor and shaft in the horizontal position, the machine can saw as follows: Cross-cutting, mitering, or ripping. Dado heads can also be used in this position. The motor can be turned to any degree



from the horizontal to the vertical. Then the motor can be swiveled so that the shaft is in a vertical position, and special tools such as bead and cove cutters, router bits, and panel raisers can be used for special work. This bench-type saw is very sturdily built throughout.

Shaper, Wood, or Variety Molder, No. 287

Oliver Machinery Co., Grand Rapids, Mich. [Vol.73,p.940.] 411.

Because of the high-speed spindle, it is possible to feed the stock to the cutters with or against the grain. The table is 36 in. square and 36 in. from the floor. An 11-in. hole in the center of the table has three

large rings with flanges, the smallest of which has an inside diameter of 2 in., allowing the spindle adapter to rotate freely. A detachable spindle is used on this shaper.

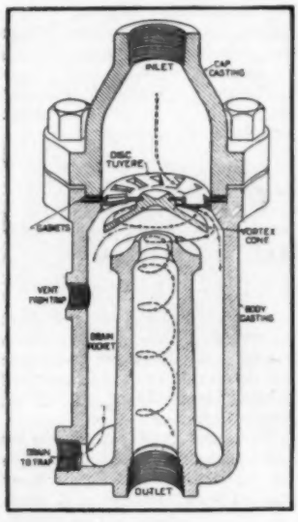
Specifications: Vertical spindle adjustment, 6 in.; length of collars, 8½ in.; diameter of collars, 1¼ in.; front edge of table to spindle, 18 in.; floor space, 26x27; power required, 5 hp., and weight, 1,350 to 1,850 lb., depending upon the drive.

Parts and Mechanisms

Cleaner, Compressed-Air

Centrifix Corporation, 3029 Prospect Ave., Cleveland, Ohio. [Vol.73,p.836.] 314.

Moisture, oil, and pipe scale in compressed air lines can be removed by means of the Type RD compressed air cleaner. These impurities not only slow



up production, but also damage tools and equipment and spoil spray-painted work. The cleaner utilizes centrifugal force to effect separation of the impurities in the air stream. It is available for ¼- to 2½-in. pipe lines.

Compensator, Clearance, "Wyr-Omat-Ick"

Wyrick Engineering Co., Wyandotte, Mich. [Vol.73,p. 1022.] 497.

Constant clearance in bearings is maintained automatically by the "Wyr-Omat-Ick" compensator. By taking up play in bearings, this compensator prolongs the useful life of the bearing and of reciprocating parts. Necessity of machining to close limits is eliminated, and lighter bearings may be employed.

The major parts are two mating helical cam-faced members, which, when placed together, will increase or decrease their joint cross-sectional dimension if rotated in opposite directions. A spring provides power to rotate the cammed members whenever the taking-up action is required. A control pin is ground and projects beyond the face of the smooth cam a distance equal to the maximum clearance required. Control ribs of the slotted cam are spaced to insure the desired dimension of readjustment required at each adjustment.

Heating Elements, Electrical

Harold E. Trent Co., 439-43 North 12th St., Philadelphia, Pa. [Vol.73,p.902.] 435.

These heating elements have been constructed to be interchangeable with other elements of similar character. The correct relationship between the area of the heating element and

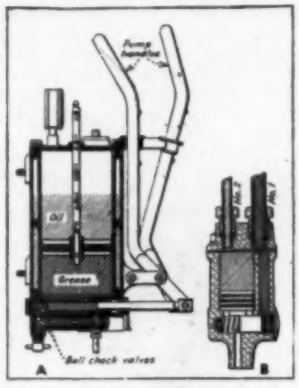
the outside casing has been determined in order to provide sufficient surface to radiate the heat generated. The element can be replaced if desired.

For stock purposes the element is supplied with a seamless brass tube, but bodies made of copper, steel, or chrome-alloy steel are available.

Lubricating System, "Farval" Dualine

Lubrication Devices, Inc., Battle Creek, Mich. [Vol.73, p.299.] 60.

Distribution of any type of lubricant that can be pumped through a pipe line can be effected by means of the "Farval" Dualine System. The system includes a positive piston displacement type of metering valve for each bearing or point of lubrication. Operation of the system is fully automatic and is controlled entirely by the hydraulic pressure furnished

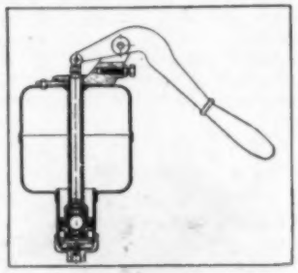


by the pump. Two supply lines are connected to each valve. One line loads each valve with a measured quantity of lubricant at high pressure; the other line discharges it.

Lubrication System

Bijur Lubricating Corporation, 250 West 54th St., New York, N. Y. [Vol.73,p.943.] 253.

Clean oil in predetermined quantities is supplied simultaneously to all bearings on a machine by the Bijur system of central lubrication. Depression

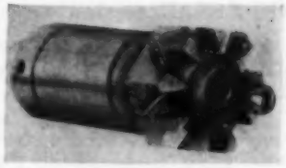


of the pump handle loads the cylinder with a predetermined quantity of oil, and release of the handle places this oil under a pressure of approximately 50 lb. per sq.in. As the lines are always maintained full of oil, flow begins immediately from each drip plug. The drip plugs apportion the measured charge of oil delivered by the pump in accordance with their flow capacities. Seven standard separate flow rates from approximately ⅛ of a drop per min. to 46 drops per min. are available.

Nut and Cotter, "Cooke"

American Railways Products Co., Inc., South Norwalk, Conn. [Vol.73,p.798.] 350.

From 14 to 22 adjustments of the castellated nut can be made on the "Cooke" micro nut and cotter. The number of adjust-

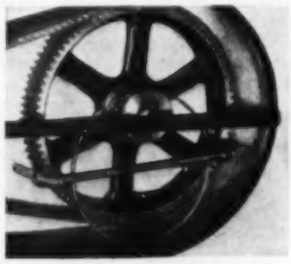


ments depends upon the size of the nut, which utilizes a self-opening and self-retaining type of cotter key. The castellated portions are of triangular section and so disposed that the apex of one section is at the center of one end of the cotter-pin hole, while at the other end of the cotter-pin hole there is a fully exposed space for the insertion of the cotter pin. The triangular section with the apex in the center of the cotter-pin hole spreads the cotter-pin automatically as it is driven through.

Oiler, Ring, Automatic, for Chain Drives

Morse Chain Co., Ithaca, N. Y. [Vol.73,p.800.] 282.

This automatic ring oiler is designed so that only clean oil is carried up and into the chain. It is made from rod steel. This

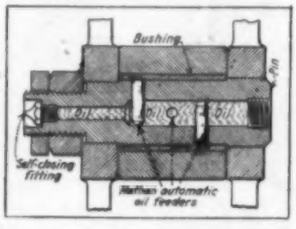


ring travels in a groove turned in the hub of one of the sprockets. Oil is taken off the ring by means of a wiper, and from the wiper it is carried in a pipe to the inside center of the chain.

Oil Feeders, Automatic

Nathan Manufacturing Co., 250 Park Ave., New York, N. Y. [Vol.73,p.984.] 479.

Oil reservoirs are built into the parts equipped with this lubricating system. In the holes which connect reservoirs and bearing surfaces, oil feeds or

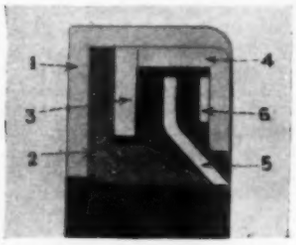


plugs are fitted for carrying the oil to the bearing surfaces. They are made of specially selected wood, treated to feed oil from the reservoirs in minute quantities to lubricate the bearing surfaces thoroughly.

Oil Seal, Precision

Gits Bros. Mfg. Co., 1846 Kilbourn Ave., Chicago, Ill. [Vol.73,p.945.] 416.

Dirt, grit, water, and foreign water can be excluded from bearings by the use of this precision oil seal, which prevents loss of oil with minimum friction, and operates equally well on horizontal and vertical shaft applications. It is made to seal



ball, roller, and plain sleeve bearing enclosures.

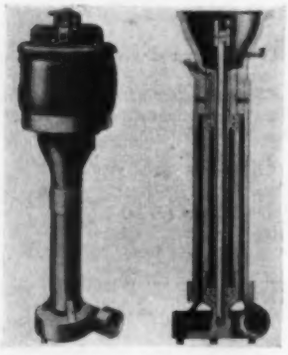
The oil seal is made up of six parts: (1) An outer retaining member; (2) a leather gasket; (3) the gasket washer; (4) an inner retaining member held in place by 1; (5) a gasket expanding member, and (6) a crimped annular spring for sealing the feather-edge gasket against the shaft.

These Gits precision oil seals are available in shaft sizes from $\frac{7}{16}$ to 6 in.

Pump, Coolant, Brownie

Tomkins-Johnson Co., Jackson, Mich. [Vol.73,p.71.] 19.

A vertical coolant pump especially adaptable to centerless grinders or for coolant purposes has been announced. The No. 1 size has a capacity of 50 g.p.m. with a maximum lift of 15 ft. A $\frac{1}{4}$-hp. motor drives



direct at a speed of 1,725 r.p.m. The height over all is $19\frac{3}{4}$ in., including the motor, and the pump can be placed in an $8\frac{1}{2}$-in. circle. The outlet pipe is $1\frac{1}{4}$ in.

The No. 2 pump has a capacity of 15 g.p.m., a maximum lift of 10 ft., a $\frac{1}{3}$-hp. motor, a 1-in. outlet pipe, and height, including the motor, of $19\frac{1}{2}$ in.

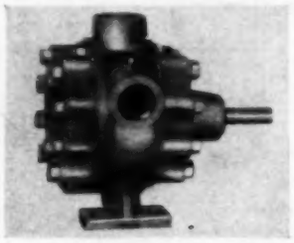
The coolant pump can be furnished with or without a motor or with a driving pulley, or of acid-resistant metal.

Pumps, Hydraulic, Series 909 and 911

George D. Roper Corporation, Rockford, Ill. [Vol.73,p.904.] 406.

Two series of geared pumps for use in machine tools, hydraulic feeds, and for accumulator tank service have been developed. Both series have ball bearings and herringbone gears, and may be furnished stripped or mounted for belt, chain, or motor drive.

The Series 909 pump is made in four sizes, Nos. 2, 3, 4, and



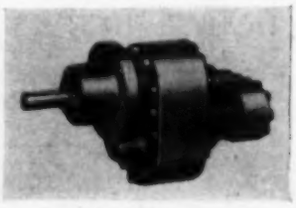
5, delivering from 5 to 50 gal. per min. at pressures up to 1,000 lb. per sq.in.

The Series 911 pump is made in nine sizes, delivering from 3 to 100 gal. per min. at pressures up to 300 lb. per sq.in.

Pump, Oil, High-Pressure, Model H

Tuthill Pump Co., 131 W. 63rd St., Chicago, Ill. [Vol.73, p.300.] 61.

Conventional external gear construction is employed. Four sizes are built, ranging in capacity from 10 to 40 g.p.m. against pressures of 1,000 lb. per sq.in., when pumping lubricating oil. The 100 g.p.m. pump



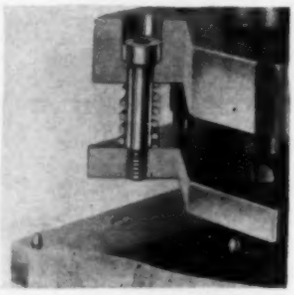
is for pressures not exceeding 500 lb. per sq.in. Motor speeds up to 1,200 r.p.m. can be employed.

A flange-type mounting is used. For foot mounting a pedestal can be supplied extra. An adapter flange is provided for both intake and discharge ports. Either clockwise or counter-clockwise rotation may be obtained.

Screws, Shoulder, Socket-Head

Allen Manufacturing Co., 133 Sheldon St., Hartford, Conn. [Vol. 73,p.939.] 405.

Cold-drawn, socket-head, shoulder screws are now being manufactured. The screws are heat-treated. Sizes of hex-



agonal sockets available are $\frac{3}{16}$, $\frac{1}{4}$, $\frac{5}{16}$, and $\frac{3}{8}$ in. across flats. Corresponding shoulder diameters are $\frac{3}{8}$, $\frac{1}{2}$, $\frac{5}{8}$, and $\frac{3}{4}$ in. Shoulder lengths for the $\frac{3}{8}$-in. size range from $1\frac{1}{4}$ to 4 in., and for the $\frac{3}{8}$-in. size from $1\frac{1}{2}$ to 8 in.

Setscrews and Capscrews with Dardelet Thread

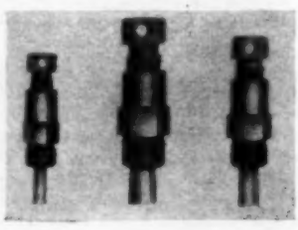
Bristol Co., Waterbury, Conn. [Vol.73,p.528.] 205.

The Dardelet screw thread is optional on "Bristo" hollow safety setscrews and socket head capscrews. All standard sizes of setscrews and capscrews are available with the thread, but not all the extra small diameters of setscrews.

Setscrew, Two-Action, "Grippit"

Wedge-Lock Tool Co., 2523 North Keller Ave., Chicago, Ill. [Vol.73,p.907.] 403.

For holding work in place on jigs and fixtures the "Grippit" affords more gripping power than the ordinary screw. It is made for use on drill jigs, milling fixtures, or assembly fixtures. The plunger does not rotate, and therefore the work does not move when locked. The device is composed of four parts: Shell, plunger, spring, and operating screw. The shell



has standard threads. One-eighth turn of the screw causes the plunger to advance from $\frac{1}{8}$ to $\frac{1}{16}$ in.

"Grippit" clamping devices are available in plunger diamters of $\frac{1}{2}$, $\frac{3}{4}$, and $\frac{1}{4}$ in.

Miscellaneous Equipment, Processes, and Supplies

Barrel Tilters, Safety

Schwenk Safety Device Corporation, Grand Central Terminal Bldg., New York, N. Y. [Vol.73,p.226.] 89.

Safety in handling and emptying heavy barrels is the feature of these tilting barrel trucks. By means of such a truck a 750-lb. barrel can be lifted into position for draining by one

man and can be trucked wherever desired. The barrel can be drained from the end or from the center bung, as desired.

Dehumidifier, "Catchdew"

National Humidity Reduction Co., Louisville, Ky. [Vol.73,p. 372.] 154.

The unit displays possibilities for removing moisture in pattern storage vaults and the protection of small tools and parts which are likely to become rusted. No fans are used with the dehumidifier. One unit will dehumidify 6,000 cu.ft. of air constantly.

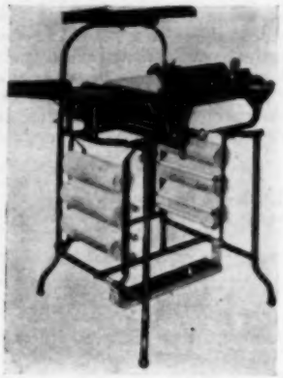
The unit is 41 in. high and $14\frac{1}{2}$ in. in diameter, with a glass jar underneath into which extracted water trickles. A chem-

ical that collects the moisture from the air is located inside a perforated container. The chemical is heated by a small electric unit.

Ditto Machine, Improved

Ditto, Inc., Harrison and Oakley Blvd., Chicago, Ill. [Vol.73,p.1028.] 492.

This improved Ditto machine is suitable for reproducing specifications, contracts, drawings and sketches at a cost of five to ten cents per hundred. In all cases a special Ditto ink, pencil, or typewriter ribbon must be used. The machine makes copies for transferring ink, which may be had in colors, direct from the original to a duplicating composition. The

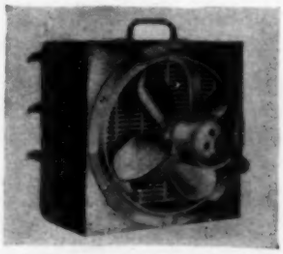


machine is made in four standard sizes: C, K, L and M, with sheet capacities from 8½x 14 to 22x34 in.

Heater, Space, Electric

The American Foundry Equipment Co., Mishawaka, Ind. [Vol.73,p.338.] 111.

Special alloy heating strips are cast integrally with composite fins of aluminum alloy, making a single smooth casting that will permit an uninterrupted flow of air through its chan-

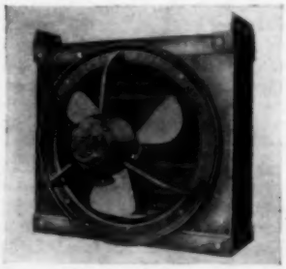


nels. Castings of this type are assembled in suitable number and size into a cabinet, in the back of which a fan operates. The heater can be used for permanent installation or as a portable heating unit.

Heater Unit, Model B, "Breezo-Fin"

Buffalo Forge Co., Buffalo, N. Y. [Vol.73,p.646.] 267.

Welded stampings make up the casing of the Model "B" suspended-type unit heater. Simple clip hangars are furnished as standard equipment and can easily be attached to any two of the four corners, providing support for platform, side bracket,



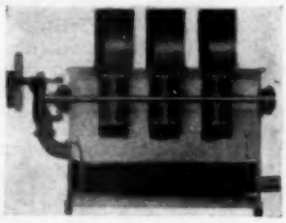
or top suspension. The fan is claimed to be unusually quiet. An "Aerofin" heater element is standard.

The Model B "Breezo-Fin" is manufactured in eight sizes. Fully inclosed motors are standard equipment.

Heater Unit, "Turbo"

Automatic Turbo Heater Co., 343 So. Dearborn St., Chicago, Ill. [Vol.73,p.685.] 291.

Complete independence from electrical control systems, motors, and wiring is the feature of the "Turbo Heater." This unit heater makes use of a low-pressure turbine to drive the fans. A thermostatic valve controls the steam supplied to the turbine. Exhaust steam from the turbine enters a condenser



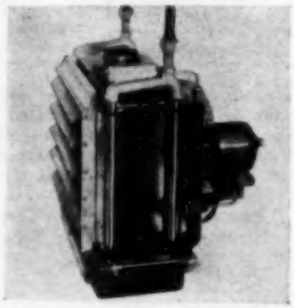
unit at the bottom of the casing, which is equipped with ¾-in. copper tubes with continuous spiral fins. Here heat is radiated to the air, which is circulated by means of the fans.

Steam pressures to 150 lb. per sq.in. can be employed to drive the turbine, and the exhaust will never exceed 5 lb. per sq.in. The unit heater is made in five sizes, in both floor and ceiling types.

Heater, Gas, Unit, No. 200 "Humphrey"

General Gas Light Co., Kalamazoo, Mich. [Vol.73,p.1023.]

Either manufactured or natural gas can be burned in the Humphrey No. 200 unit gas heater which has an input rating of 200,000 B.t.u. per hour and is



83 per cent efficient. It is equivalent to about 700 sq.ft. of steam radiation. The unit will deliver 2,600 cu.ft. of air per minute with a 50-deg. temperature rise over room temperature. Over-all dimensions are 32½ in. high, 28¾ in. wide, and 31¼ in. deep.

Puller, Gear and Wheel, Universal, "Steelgrip"

Armstrong-Bray & Co., Chicago, Ill. [Vol.73,p.649.] 276.

Large or small gears, wheels and pulleys can be removed from shafts by means of the "Steelgrip" universal gear and

wheel puller equipped with three 3-ft. chains. A chrome-nickel steel screw with a hardened point is employed. Pulling power is approximately 4 tons. The No. 4 heavy-duty puller used on large and heavy work, has a pulling power of more than 12 tons.

Pump, Hand, for Steel Drums

Rothweiler & Co., 2430 First Ave., Seattle, Wash. [Vol.73, p.648.] 268.

Pumping cutting compounds, machine oil, and lard oil are uses for the "Useful" pump. Other uses in metal-working

establishments include pumping of paint, lacquers, and thinners. The pump will fit all steel drums. It fits the small opening, replacing the faucet.

Rack, Time Card

Hamilton Manufacturing Co., Two Rivers, Wis. [Vol.73,p. 33.] 11.

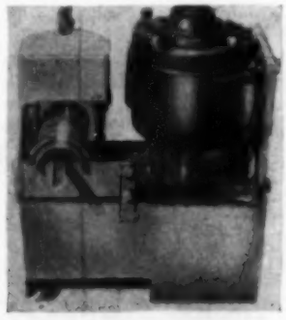
This time card rack is for with tabulating machines. The rack itself is 21⅞ in. high, 8⅛ in. wide, and 6¾ in. deep. There

are five tiers of time card compartments, 3½ in. high in front, 12 in. high in back, and 8 in. wide. Compartment divisions are of 20-gage steel finished in black enamel, whereas the remainder of the rack is of varnished gunwood. Weight, 15 lb.

Reagent Feeder, Precision

Coeur d'Alene Hardware & Foundry Co., Wallace, Idaho. [Vol.73,p.942.] 396.

The motor-driven, totally enclosed type illustrated is used especially for constant, small-quantity feeding of acids. It is

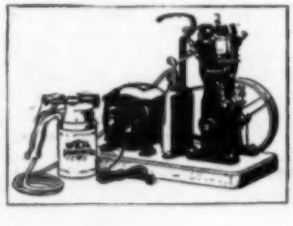


regularly fitted with a 110-volt, single-phase, 60-cycle motor. The feed may be adjusted.

Spraying Apparatus, Paint, "Oscillator"

Weil Machine Co., 2648 E. Fort St., Detroit, Mich. [Vol. 73,p.69.] 30.

All oil and lead paints and lacquers can be sprayed by means of the "Oscillator" paint spraying equipment. An even flow of air is furnished. A motor is mounted on the base with



the compressor, an accumulator with a gage, and a vacuum type spray gun and paint container.

Spring Assembly Outfit, Leaf

Naudain Manufacturing Co., 1001 Rectory Lane, Baltimore, Md. [Vol.73,p.221.] 76.

This assembly outfit is for clamping spring leaves in order to put in the center bolt. The outfit will clamp any size spring with safety in a few minutes. Clamping is effected easily by a screw. Adjustable side arms on each side of the clamping

jaws take care of the different size springs. Clip bolts can be put in without moving the spring.

The stand is made of steel, and is 40 in. long, 31 in. high, and 24½ in. wide.

Tool Chest, No. 33

H. Gerstner & Sons, 180 Columbia St., Dayton, Ohio. [Vol.73,p.455.] 130.

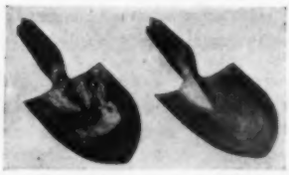
A tool chest designed for pattern makers, millwrights, and maintenance men has been placed on the market. The No. 33 chest is 30 in. long inside the

top compartment and 8¼ in. high. It has a saw rack, a place for a 16x24-in. square, and the smaller tools are taken care of in a series of felt-lined drawers measuring 4¼, 8½, and 14¼ in. long and ranging from ⅞ to 2 in. in depth.

Cleaning Process, Electro-Chemical

Bullard-Dunn Process Division of the Bullard Co., Bridgeport, Conn. [Vol.73,p.611.] 271.

Scale, oxides, and grease can be removed by the proper components of the process. If the articles are dirty and covered with grease or oil, they can be placed in an alkali bath having lead anodes. Scale and oxides are removed in an acid bath. Hot and cold rinsing tanks are required.



No pitting occurs in the acid bath. Hydrogen is liberated under the scale or oxide by the electrochemical action and works it loose. Immediately thereafter lead is deposited on the clean metallic surface. This lead coating is of value in subsequent deep-drawing operations and also provides a base for plating.

In subsequent manufacturing operations (polishing included), the de-scaled and clean products coming from this process are conducive to reduced tool cost and quick assembly.

Alloy, Heat-Resistant, "Calite F"

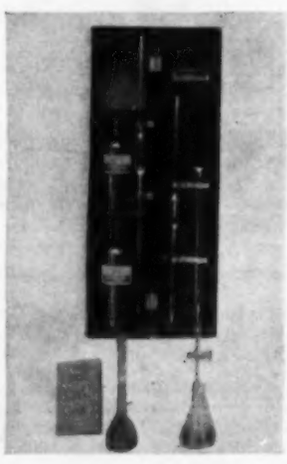
Calorizing Co., Wilkinsburg Station, Pittsburgh, Pa. [Vol. 73,p.683.] 311.

This nickel-chromium alloy that possesses the quality of casting in comparatively thin sections is known as "Calite F." It is recommended for thin-wall carburizing boxes, annealing pans, enameling racks, and other furnace fixtures. The material has a maximum safe working temperature of 1,900 deg. F., at which the safe load is 1,250 lb. per sq.in. When cast in box form, sections may be $\frac{3}{16}$ to ¼ in. in thickness. Carburizing boxes are "Calorized" or coated with a thin film of aluminum on the inside to prevent corrosion from sulphur.

Analytical Set, Chromic Acid

Kocour Co., Inc., 4724 So. Turner Ave., Chicago, Ill. [Vol.73,p.338.] 143.

Developed to replace the hydrometer because of the latter's inaccuracy, a chromic acid analytical set is now being



manufactured for use in determining the amount of chromic acid in solution in plating baths. The method used is known as permanganate-ferrous sulphate titration. By a procedure which balances out the changing ferrous sulphate solution automatically, a direct reading in ounces per gallon of chromic acid is simply and quickly obtained.

The set consists of a special burette, two pipettes, two bottles of solution, a volumetric flask, an Erlenmeyer flask, and a direction card. The set reads directly, and is accurate to the one-half ounce of chromic acid per U. S. gallon. No calculations are required.

Acid, Pickling

Shell Petroleum Corporation, St. Louis, Mo. [Vol.73,p.757.] 353.

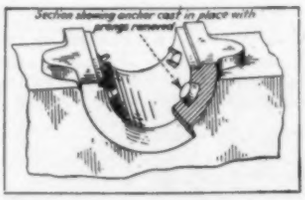
This pickling solution has a sulphuric acid content of 73 to 75 per cent, approximately equivalent to 60 deg. Baumé acid. Because of the inhibitor present, Shell pickling acid attacks only the scale without the liberation of hydrogen. Once the scale or rust is removed, the action is stopped. As there is no action of the acid on the virgin steel, the surface is left clean, smooth, and free from pits.

Shell pickling acid is shipped in tank cars or in 50-gal. steel drums.

Anchors for Babbitt Bearing Linings

Smith & Richardson Manufacturing Co., Geneva, Ill. [Vol. 73,p.414.] 179.

Conical recesses are formed in the face of the casting, against which the babbitt linings are to be cast, by means of



"Babbitt Anchors." These are made of thin, coated sheet steel. The prongs, which project when the casting is taken from the sand, are removed in the cleaning operation.

These "Babbitt Anchors" are made in two sizes, ⅜x½ in. deep, and ½x$\frac{5}{16}$ in. deep.

Belting, Tension-Cemented

Graton & Knight Co., Worcester, Mass. [Vol.73,p. 33.] 8.

A new type of cement is used on this belt, applied uniformly and continuously in a machine. Constant tension is maintained on the double belt after it is cemented. Belts made by this method require at least twice the usual pull to separate the plies. In addition, the belts are waterproof and resist friction or other heat to a greater degree.

Brake Lining, Woven, "Vel-Co"

Raybestos Division of Raybestos-Manhattan, Inc., Bridgeport, Conn. [Vol.73,p.799.]

Uniform co-efficient of friction is the feature of "Vel-Co" woven brake lining. This is an asbestos-metallic woven lining having a waterproof, heat-resisting treatment and strands of soft, pliable metal in staggered formation interwoven with the asbestos yarn spun with brass wire. It is manufactured in 50-ft. continuous rolls, obtainable in all sizes from 1½x$\frac{5}{16}$ in. up to 2½x¼ in. section.

File Handles, "Stronghold"

Henry Disston & Sons, Inc., Philadelphia, Pa. [Vol.73,p. 265.] 62.

A coiled, spring-steel ferrule and a slit-end handle permit the use of several sizes of files

to one handle. The "Stronghold" file handle is made from hardwood in five different lengths and thicknesses.

Finishes, "DuLux"

E. I. du Pont de Nemours & Co., Inc., Philadelphia, Pa. [Vol.73,p.757.] 323.

Paint-like finishes based on DuLux oil can be used on wood or metal products. Finishes based on DuLux gum are for use where durability must be combined with faster drying (10 to 20 min. dust free) and greater hardness, and where finishes of enamel-like appearance are desired, such as on metal goods and machinery. It does not chip or crack.

DuLux finishes are resistant to gases, fumes, brine, and other deteriorating agencies. A full range of colors is available. When used in a spray gun, DuLux atomizes freely, but

still has enough body to adhere to vertical surfaces without sagging, breaking, or running. It is also practical for brush application.

Grease for Motors

General Electric Co., Schenectady, N. Y. [Vol.73,p.643.]

This grease has been successfully employed for ball-bearing motors with speeds as high as 25,000 r.p.m. and temperature exposures from —25 to 250 deg. F. The grease contains no free acid or water, and will not turn rancid. There is very little tendency to gum-cake or separate. It has unusual film strength, enabling it to withstand severe thrusts and heavy bearing loads. It is supplied in 2-oz. tubes and 1-lb. cans.

Iron, High-Strength, "Aremite"

Robbins & Meyers Sales, Inc., Springfield, Ohio. [Vol. 73,p.640.] 294.

This iron has a tensile strength that can be varied between 30,000 and 50,000 lb. per sq.in., depending upon the hardness desired. At the lower limit, a Brinell hardness of 165 is attained, with corresponding ease of machinability. The microstructure of this material is similar to that of malleable iron.

Joint Compound, Plastic, Expansive, "Q-Seal"

Quigley Furnace Specialties Co., Inc., 56 W. 45th St., New York, N. Y. [Vol.73,p.178.] 59.

The pigment expands and is carried in a vehicle that also expands several times its own volume when subjected to heat. The material used is impervious to steam, gas, gasoline, kerosene, oils, acids, ammonia, brine, vapor, creosote, tar, air, and similar harmful materials. The compound fills any imperfections in gaskets, threads, or metallic surfaces in fabricating joints. It prevents corrosion or oxidation and still the joints may be broken with ease.

Lubricants, Gear, "Tenac"

E. F. Houghton & Co., Third, American & Somerset Sts., Philadelphia, Pa. [Vol.73, p.796.] 359.

Gear lubricants for heavy, slow-moving, open gears have been developed in four grades, under the trade name of "Tenac." They are not thrown off the gears while in motion. "Tenac" No. 1 is the heaviest of the series, while No. 4 is the lightest grade. One of the features is the extremely low cold test of these lubricating materials.

Paint, Front-End, for Locomotives, "Locomax"

American Tar Products Co., Koppers Building, Pittsburgh, Pa. [Vol.73,p.302.] 122.

Two months' service with one application can be obtained from "Locomax," a front-end paint for locomotives developed by the Koppers Research Corporation, Pittsburgh, Pa., and being marketed by the above concern. It can be applied on hot surfaces without flashing back. It is a bituminous product that produces a satin-like finish similar to that produced by a graphite paint. It can be obtained in standard black and standard gray egg-shell finishes from jet black to a light steel gray.

Rubber Compound, Plastic, Self-Curing, "Covulc"

The Hitchcock Co., 48 Pearl St., Boston, Mass. [Vol.73,p. 985.] 477.

Repair and maintenance of equipment subject to extreme wear or corrosion can be effected with "Colvulc" self-curing plastic rubber compound. It can be quickly applied and requires no heat nor pressure. It is supplied in paste form. Typical applications are the resurfacing of conveyor belts and the conveying of metal parts where corrosive conditions exist.

Varnish for Castings, "Durez," No. 278

General Plastics, Inc., North Tonawanda, N. Y. [Vol.73,p. 493.] 211.

To prevent corrosion of certain ferrous and non-ferrous castings, an application of "Durez" No. 278 varnish may be used to overcome porosity. It retards corrosion from sea water, dilute alkalies, acids, ammonia, and certain anti-freeze compounds. The baking temperature is 250 to 300 deg. F.

Wedgelock for Shipping Purposes

Wyrick Engineering Co., Wyandotte, Mich. [Vol.73,p. 528.] 223.

This wedgelock prevents products from shifting within the packing case, box or other container. The device is made up of two wedge-shaped blocks

that slide on their inclined faces. A tension spring in a slot between these faces tends to slide one block up on the other.

The "Wyr-Omat-Ick" wedgelock is made in nominal thicknesses of ¾ to 3½ in., and in lengths from 2 to 10 in.

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Boring Machines

Boring Machine, Horizontal, 2-Spindle

Ward, Haggas & Smith, Keighley, England. [Vol.73,p. 190E.] 106.

This double-spindle, motor-driven horizontal boring machine is employed for boring, at right-angles, worm reduction gear cases of various sizes. Spindles have a horizontal traverse of 30 in. The heads are adjusted up and down the columns by hand motion, and

the columns can be adjusted along the guide ways of the beds for a distance of 12 in. Each boring saddle carries a self-contained 5-hp. motor. The 18 spindle speeds range from 21 to 514 r.p.m. Three self-acting feeds range from 26 to 48 cuts per in. An automatic stop motion to the motor operates when the spindle has reached the desired length of bore.

Floor space, 8 ft.; total height, 8 ft.; and weight, 13,400 lb.

Boring Mill, with Hinged Cross-Slide, Railway-Wheel Tire

J. Hetherington & Sons, Ltd., Ancoats, Manchester, England. [Vol.73,p.161E.] 95.

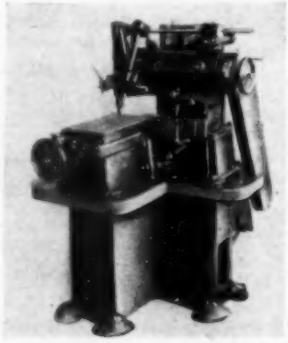
This tire-boring mill can also be used for ordinary purposes as a vertical turning and boring mill. The arm can swing clear of the machine, leaving an open table on which the work can be placed. The crane can also swing out of the way when not needed. Capacity of the mill is for tires up to 6 ft. The machine can be used for the full range from maximum diameter down to zero, both rams traveling independently to the center of the table. Special dogs set, hold, and drive the tires without distortion.

The drive may be by motor or belt. The chucks are of the quick-acting type, with single-screw hinged clamps for gripping the tire, and arranged to take removable steel pads of various thicknesses to accommodate tires of various widths.

Boring Machine, Jig

S. G. Jones, Ltd., Brixton Road, London, S.W., England. [Vol.73,p.177E.] 103.

The above concern is agent for Henri Hauser S.A., Bienne, Switzerland, the manufacturer of this jig-boring machine, which is powered by a ½-hp. motor. Four spindle speeds are provided, ranging from 500



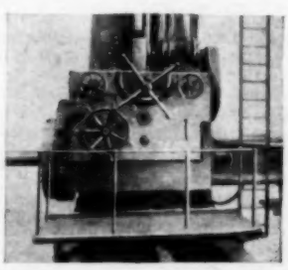
to 1,600 r.p.m., the nose being bored No. 1 Morse taper. Holes up to ½ in. diam. can be drilled and reamed. Holes up to 1 in. can be opened-out with a single-point tool. Travel of the boring spindle is 4 in.

The two micrometer screws, which locate the table and top slide respectively, are supplied with graduated drums and verniers reading to 0.0001 in. An automatic compensating device is fitted to each slide. Longitudinal travel of the table is 12 in., and the transverse travel of the top slide is 8 in. Allowing for drill clearance, work approximately 8 in. high can be handled. A 12-in. circular table is provided, and is graduated in degrees.

Control for Horizontal Boring Machine

Selson Engineering Co., Ltd., Hatton Garden, London, E.C., England. [Vol.73,p.148E.] 91.

An improved system of control has been developed for the Collet & Engelhard horizontal boring machine marketed by the above concern. The redesigned spindle head carries a reversible driving motor on the top face. The main feature is the simplification of the internal mechanism, whereby the number of operating levers and handwheels has



been reduced substantially, plus the improved control. A system of direction plates has been developed to cover every lever or handwheel motion on the head. These plates are symbolic indications which claim to make the purpose of the levers self-explanatory. For obtaining various individual speeds or feeds, an indicating drum is rotated by a pilot wheel, the symbol plates being used in conjunction. One handle only changes all feeds, one changes speeds, one covers fine and rapid axial spindle adjustment, and one handle sets the spindle vertically or horizontally and locks it in position. Push button control can be semi- or completely automatic.

Drilling Machines

Drilling Machine, Radial, Two-Spindle, 6-Ft.

Kitchen & Wade, Ltd., Halifax, England. [Vol.72,p.262E.]

This machine has an additional tapping spindle and swing-away table. It will drill holes up to 3¼ in. in cast iron and 3 in. in mild steel. All the speed and feed changes have been arranged on the saddle.

The drive is direct by a 10-hp. motor mounted on a bracket bolted to the arm. The base-

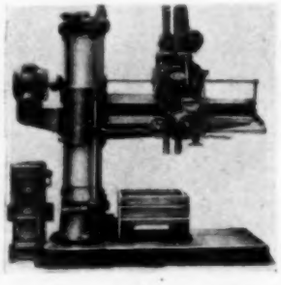


plate has a working surface 6 ft. 4 in. by 3 ft., and the swing-away table measures 32 in. by 24 in., and has planed T-slots on all four sides and the top.

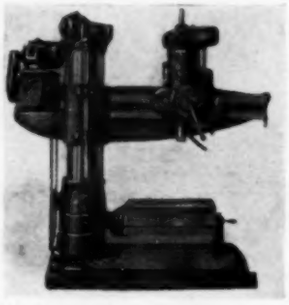
The saddle has centralized control, ball bearings throughout, nickel-chrome change gears running in oil bath, ball-bearing rollers for racking, and a reverse and quick back-out for tapping on one lever. The vertical feed is 18 in. The 18 spindle speeds range from 580 to 27 r.p.m., and the 8 feeds from 36 to 150 cuts per in. Automatic trip to the feed is provided.

Maximum distance from spindle to baseplate is 5 ft., vertical adjustment of arm by power, 3 ft., traverse of saddle along arm, 4 ft. 2 in.; floor space, 10 ft. 2 in. by 3 ft. 3 in., and net weight, 6¼ tons.

Drilling Machines, Radial, Electrically-Driven

E. G. Herbert, Ltd., Manchester, England. [Vol.73,p.46E.] 56.

These radial drilling machines are made by Ateliers G.S.P., Albert, Somme, France, and are available in two sizes, namely, 39 and 49 in., and either electrically or belt-driven. Ver-



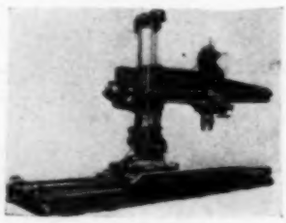
tical traverse of the spindle is 13 in.; maximum height of the spindle nose over the floor, 59 in., and the baseplate, 4 ft. 1 in. by 2 ft. 9 in. A gearbox of Norton type gives six speeds and the spindle has 18 speeds. The spindle is reversed by a lever at any speed for tapping and studding. Four automatic feeds are provided for each spindle speed and can be changed while the spindle is running.

A pivoting table, 2 ft. 8 in. by 1 ft. 4 in. on the sides, can be rotated by worm gear to any desired angle. Maximum size of hole drilled is 2 in. in cast iron for all machines.

Drilling Machine, Radial, Heavy-Pattern, 10-Ft.

W. Asquith, Ltd., Halifax, England. [Vol.73,p.81E.] 68.

This heavy-duty, central-thrust radial drilling machine is mounted on an extra long traverse bed, and is fitted with an auxiliary tapping spindle. It will drill up to 3 in. in steel and 4 in. in cast iron. The maximum radius is 10 ft. and the minimum radius, 2 ft. 11 in. It admits work 10 ft. 9½ in. high between the spindle nose and the floor line. The traverse bed is 29 ft. long, by 4 ft. 10 in. wide, by 18 in. deep. Motion of the machine along the bed is through 22 ft., by a screw



operated by a 5-hp. motor and controlled by limit switches. A single lever controls both the arm-elevating motor and the motor for the traverse on the bed.

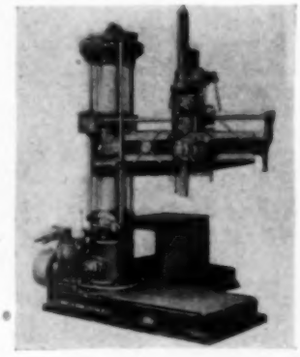
The spindle is bored No. 5 Morse taper. A constant-speed, 10-hp. motor at the back of the arm, and a nine-speed gearbox and triple gears on the saddle give 27 spindle speeds, varying from 300 to 8 r.p.m., with six rates of feed from 30 to 100 cuts per in. A 5-hp. motor is employed for elevating the arm.

Exclusive of the motors, the machine weighs 30 tons, and the total height is 18 ft. 9 in.

Drilling Machine, Radial, 4-Ft.

G. Swift & Sons, Ltd., Halifax, England. [Vol.73,p.134E.] 87.

This radial drill will drill up to 3 in. in cast iron and up to 2½ in. in steel. It admits 4 ft. 7 in. between the baseplate and the spindle, and will drill to the center of a 6 ft. 6 in. circle. The base has a working surface of 4 ft. by 3 ft., an additional baseplate, 4 ft. by 3 ft., being mounted at right angles



and carrying a loose box table, 30 by 24 by 24 in.

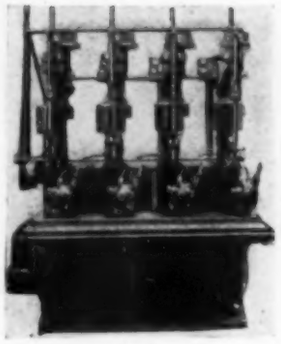
The saddle travels on the arm 2 ft. 6 in. The driving spindle is bored No. 5 Morse taper and the vertical traverse is 15 in. The 18 spindle speeds range from 27 to 500 r.p.m., and the feeds range from 55 to 105 cuts per in. Power elevating motion of the arm is 2 ft. 4 in.

Floor space, 9 ft. 1 in. by 7 ft.; height with spindle in highest position, 10 ft. 10½ in.; and net weight, 8,600 lb.

Drilling Machine, Upright, Four-Spindle

Alfred Herbert, Ltd., Coventry, England. [Vol.72,p.275E.] 9.

This machine is intended for the quantity-production of wire wheels for road vehicles. The machine consists of four cam fed spindle heads mounted on a common base, the heads being driven from the main shaft at the back through independent



clutches. The spindle cams give rapid advance to the work, correct drilling speed with feed and drill-relieving motion, and quick return. Sufficient dwell is allowed to enable the operator to index the work fixture by hand. Drive to the cams is through an independent epicyclic gearbox. An output of 48 pieces per hour has been attained.

Drilling Machine, Upright, Manufacturing, Duplex, 25-In.

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p.24E.] 47.

High-powered manufacturing drilling machines with frame capacities of 25 to 32 in., to drill up to 4-in. holes, are available. The machines have single or multiple spindles with independent motor or belt drive direct from the lineshaft. A gearbox provides four speeds.

If required, a backgear is added, thus giving eight speeds. For single-purpose work, pick-off gears may be fitted instead of a gearbox.

The automatic feed is provided by a three- or four-speed box. Reverse for tapping is also fitted, if desired.

Drilling Machine, Upright, Sole-Bar

Kitchen & Wade, Ltd., Halifax, England. [Vol.73,p.46E.]

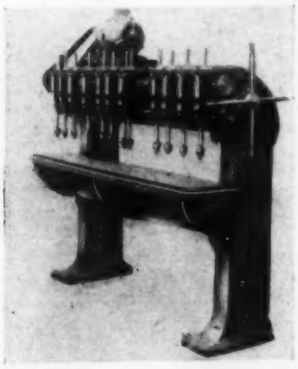
This sole-bar drilling machine has eight drilling heads, each independently driven by a vertical motor, and mounted on a bed 60 ft. long. The heads have ball-bearing carriages, and the operator simply slides the head in or out, or sideways, as desired, by means of the handwheel seen in front, which also adjusts the spindle quickly up

and down. The heads can be made with one, two or four spindle speeds, and with either one or three rates of power-driven feed. The length of feed is 12 in., and the in-and-out traverse of the drilling head 20 in.

Drilling Machine, Upright, Twelve-Spindle

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 99E.] 75b.

The 12 spindles on this machine have minimum centers of 2 in., or 3 in. at the bearings. Maximum centers between the outside heads is 61⅜ in., the design allowing this dimension to



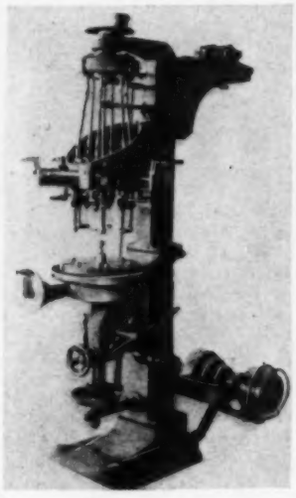
be increased readily to meet requirements. The spindles are bored No. 1 Morse taper, the least diameter being ⅜ in., and the maximum and minimum distances from nose to table are 8 in. and 4 in., respectively, the vertical feed being 4 in.

Drilling Machine, Upright, Six-Spindle

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 100E.] 75c.

By means of this six-spindle vertical machine, a large number of accurately-spaced holes may be produced without the use of jigs. It will drill holes from the smallest size up to ⅞ in., and they may be evenly spaced as required in circles ranging from 3 in. to 10 in. Moreover, the six spindles may be set positively to drill in squares or rectangles or to any uneven spacing required, within the scope of the machine.

The adjustment of the spindles is arranged for by universal joints. Adjustable brackets, fitted to equidistant ways provided on a column-supported



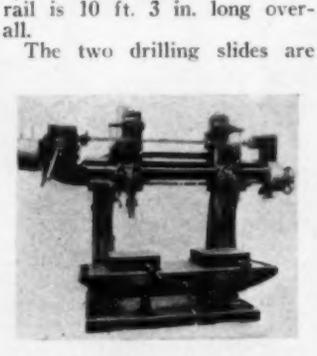
ring, carry the drill spindles, all the ways converging toward the center. The table is fed upwards by hand, or by power in three rates. The table itself carries an indexing mechanism which provides for all spacings in multiples of the number of spindles in use.

Drilling Machine, Cross-Rail, Two-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.73,p.175E.] 100.

This two-spindle, belt-driven, crossrail drilling and tapping machine is adapted for drilling valve rods, pinion links, and brake levers, where two holes can be advantageously drilled simultaneously with one setting of the work. It will drill holes up to 2½ in. diam. in steel, the maximum centers being 5 ft. 6 in. and the minimum, 11 in. The baseplate is 7 ft. 6 in. long by 4 ft. 7 in. wide. The crossrail is 10 ft. 3 in. long overall.

The two drilling slides are



adjusted along the crossrail on roller bearings, by hand power. Both drilling heads are arranged for right- and left-hand control. Power feed can be applied. The spindles are reversed for tapping independently by a lever on the drill slide. Spindle speeds range in six steps from 100 to 400 r.p.m., while the four feeds range from 38 to 120 cuts per in. The main worktable has a working surface of 7 ft. 4 in. by 4 ft. 6 in.

Floor space, 12 ft. 6 in. long by 7 ft. wide; height, 9 ft. 6 in., and weight, 6 tons.

Drilling Machine, Horizontal

W. Asquith, Ltd., Halifax, England. [Vol.73,p.67E.] 64.

This motor-driven, horizontal drilling and tapping machine has a 1½-in. spindle that will drill holes from ⅜ to 1½ in. from the solid in steel and face up to 2 in. The drill spindle has a vertical traverse up and down the column of 2 ft., and 8 ft. of horizontal adjustment.

The main traverse bed on which the column is mounted is 11 ft. 10 in. long by 2 ft. 8 in.

across the square guide ways, and the table cross-bed is 10 ft. by 4 ft.

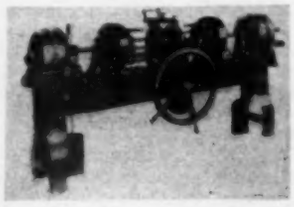
The balanced drill slide carries, in addition to the main spindle-driving motor, all the spindle controls and motor switchgear, and is adjustable vertically by hand. Three automatic feeds are driven by a friction clutch, and the spindle speeds range from 600 to 140 r.p.m.

Floor space, 18 ft. by 18 ft.; weight, 9½ tons.

Drilling Machine, Horizontal

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 101E.] 75d.

Each of the opposed spindles of this horizontal drilling machine is equipped with a 12-spindle attachment. The heads are coupled to a central capstan wheel and feed in toward the center simultaneously. The floor-to-floor time for the production of 24 holes, each $\frac{7}{32}$ in.



diam. and of predetermined depth, was 29 sec. A revolving worktable can be supplied to take the place of the central jig in machines of this type.

Drilling Machine, Horizontal, Duplex

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 101E.] 75e.

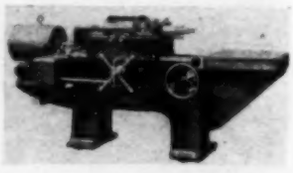
This duplex, six-spindle horizontal drilling machine will drill holes from $\frac{1}{16}$ to ½ in. diam. in steel. The holes can be ac-

curately indexed to any number on a circle and spaced vertically at any distance within a maximum of 9 in. and a minimum of $\frac{1}{64}$ in. All spindles have three speeds and three automatic feeds, with automatic knock-off and dead stop on return.

Drilling Machine, Horizontal, Three-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.73,p.162E.] 97.

This single-head, three-spindle, horizontal drilling machine is suitable for drilling holes up to 1¼ in. in flanges and webs of steel channels and I-beams of various depths. The drilling head has power feed traverse along the bed, and vertical guide ways off the right-



hand end of the bed carry the worktable. Both the drilling head and the worktable are adjusted easily.

The three spindles are adjustable in centers from 3½ in. minimum to 4½ in. maximum, but no radial adjustment is provided. They have two speeds, 410 and 660 r.p.m., and the drive is by a 7½-hp., constant-speed motor. The worktable is 2 ft. by 2 ft. 3 in. and is arranged to elevate and lower by hand motion through 6 in.

Floor space, 9 ft. 3 in. long by 3 ft. 8 in. wide; weight, 2 tons; capacity, channels and beams from 80 mm. to 300 mm.

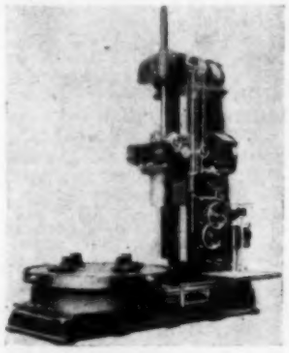
Drilling Machine, Special, Flue-Flange, Three-Spindle

W. Asquith, Ltd., Halifax, England. [Vol.72,p.339E.] 33.

This three-spindle machine is specially designed for drilling holes in flanges of flues from 21 in. to 5 ft. in diameter and from 21 in. to 5 ft. in depth between the flanges. It only requires one setting of the flue. The drilling head can be raised and lowered 3 ft. by power, with hand adjustment. Rotary motion of the table is by hand or power, and the slide on which it is mounted is adjustable a distance of 18 in. to and from the column, by hand or

power, so that the maximum and minimum distances of the spindles from the center of the table are 2 ft. 9 in., and 13½ in.

The balanced drilling head has a slow power feed downward, with adjustable trip, and is returned to the top position by quick power motion. The power feed is obtained through a feed box at the top of the

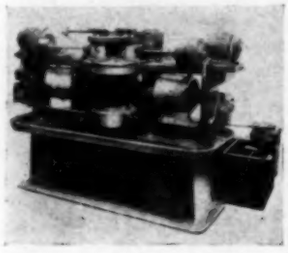


column. Spindles are fitted with quick-change chucks. The middle spindle has linear adjustment to and from the column, while the two outer spindles are adjustable radially. Drive is by a 12½-hp. motor. The worktable is 5 ft. 6 in. in diameter on the machined surface. Four jaws grip the flues.

Drilling Machine, Piston

J. Holroyd & Co., Ltd., Milnrow, Rochdale, England. [Vol.73,p.206E.] 113.

The machine illustrated is for drilling, boring and reaming gudgeon pin holes in motor car pistons, and is an improved model. Electric drive is now employed and the machine has three spindles. The work is



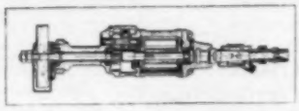
carried on a revolving table which will hold four pistons, and has one position for unloading and loading. Five constant-speed motors are employed, that is, one for each of the three spindles, another for the feed drums, and a fifth for the dividing mechanism.

Drills and Grinders, Portable, Pneumatic

Demag Aktiengesellschaft, Duisburg, Germany. [Vol.72,p. 278E.] 12.

The portable drill is available in three sizes to drill holes up to ½ in., 1¼ in., and 2 in., similarly reaming holes, ⅝ in., 1⅝ in., and 1⅞ in. Unloaded, the spindle of the largest machine runs at 180 r.p.m., and the smallest at 650 r.p.m. The largest machine weighs 40 lb. and the smallest, 22 lb. The driving shaft and drill spindle run in ball bearings.

The spindle support for the

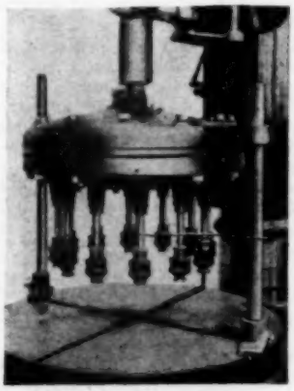


portable grinder is necked and knurled longitudinally so that it is easily gripped for hand use, or the body may be bolted in a vise or on the lathe slide-rest. Wheels range up to 6½ in. diam. The motor takes about 1.3 hp., the speed of the grinding wheel, running light, is 2,800 r.p.m., and the weight is 24 lb.

Drillheads, Multiple-Spindle

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 98E.] 75a.

Multiple-spindle drilling heads for use as attachments to single-spindle machines are manufactured in several standard styles, the various spindles being driven by a central gear and idlers.



Thrusts are taken on ball bearings, and vertical adjustment is commonly provided to each spindle sleeve to allow for varying lengths of drills. An adjustable stop prevents rotation in any position.

The standard styles have circular bodies, and attachments of this form may have a circular T-slot, this enabling stops to be set so that the number of holes drilled may be doubled or trebled at one setting of the job.

Drillheads, Unit, Automatic

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.154E.]

These unit drillheads are entirely self-contained and driven by their own electric motors. They can be used singly or built-up in combinations. The unit drillhead illustrated is driven by a ½-hp. constant-speed motor, the feed being obtained by means of a cam arranged to give quick advance, slow drilling feed, and quick return. The feed can be arranged to operate on a continuous time cycle or to be started by means of a lever and tripped automatically at the completion of each cycle, or the automatic feed can be discontinued and a sensitive hand lever feed employed.

For manufacturing purposes the head is supplied with one drilling feed only. The maxi-

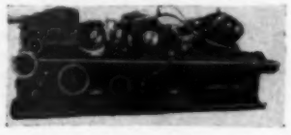
mum size of drill taken is ¾ in. The stroke of the spindle feed by hand is 2¼ in., the normal automatic stroke being 1¼ in., and the maximum automatic feed stroke 1⅞ in. A range of spindle speeds between 600 and 3,400 r.p.m. is obtained by means of change gears. The drill head may be fitted with a tapping attachment.

Grinding Machines

Grinder, Centerless, Heavy-Duty

T. Ryder & Son, Ltd., Bolton, England. [Vol.73,p.118E.] 81.

This Lidköping centerless grinder manufactured in Sweden is suitable for dealing with bar and tube work from ¾ to 10 in., or with suitable wheels up to 12 in. The machine utilizes 80 hp., and works by the usual through-feed method. In addition, by the in-feed process work with shoulders can be under-



taken up to the maximum width of wheel, namely, 12¾ in. The bed is purposely kept relatively low, the height from the floor to the center of the grinding spindle being 3 ft. 6 in., and the controls have been centralized.

The grinding wheel spindle runs on ball bearings. The grinding wheel is 25⅝ in. in diam. by 12¾ in. wide and runs at 1,030 r.p.m. The range of speeds is from 4 to 60 r.p.m., for grinding and 360 r.p.m. for truing. A power truing attachment is available.

For heavy bars and tubes, roller steadies are arranged at each end of the work, and, if necessary, a hand-operated crane is available for changing wheels. The drives are by five electric motors. The net weight, excluding the main drive motor, is 22,000 lb., and the floor space occupied is 10 ft. by 16 ft.

Grinder, Roll, Special

Selson Engineering Co., Ltd., Hatton Garden, E.C., England. [Vol.73,p.16E.] 44.

This Naxos-Union grinder is for grinding and polishing copper rolls used in intaglio printing machines, the largest roll bein 15¾ in. In place of the usual centers, the roll is carried by special rests, which form a bearing on the necks at each end of the roll. The driving head is belted to the main driving shaft at the rear. The upper shaft on the head drives down to the spindle by a belt.

The grinding wheel removes the etchings from the face of the roll, after which the polish-

ing head is brought into operation. The polishing head consists of a heavy overarm which carries the polishing wheel on a vertical spindle at the front end above the roll. The polishing wheel runs at about 300 r.p.m., and the roll itself is rotated at slow speed while the table is run at a medium rate. The feed can be set to operate at each reversal or at every second reversal of the table.

Grinder, Plain, Hydraulic, Improved

Selson Engineering Co., Ltd., Charles St., Hatton Garden, E.C., England. [Vol.73,p.66E.]

This Naxos hydraulically operated plain grinder can be fitted with drive from a flanged motor, from a motor on a pedestal, and also from a motor and flexible coupling. Single pulley drive can also be arranged.

Hydraulic motion is fitted for

the table travel and the wheelhead cross-motion. Starting and stopping of the work and table can be effected simultaneously or independently.

Micrometer control of the wheel head is graduated to 0.0004 in. A pressure pawl is also fitted to give a feed per stroke as fine as 0.0001 in. An automatic stop can be set to disengage the feed. For straight-in feed grinding an oscillating motion at about 20 strokes per min. is given to the grinding spindle.

Maximum diameter of work ground is 7¼ in., maximum lengths between centers, 19¾, 29½, and 39½ in.; work speeds from 55 to 380 r.p.m., table speeds, 8 in. to 33 ft. per min.; power required, 10 hp.; floor space of the shortest machine 8 ft. 3 in. by 6 ft., net weight, 2,700 lb.

Grinder, Internal, Cylinder, Vertical

United Machine Tool Co., Ltd., Gray's Inn Road, London, W.C., England. [Vol.72,p. 276E.] 10a.

This vertical cylinder-grinding machine is made by Friedrich Schmaltz, G.m.b.H., Offenbach, Germany. Three flanged motors are used. One is placed vertically on the top of the

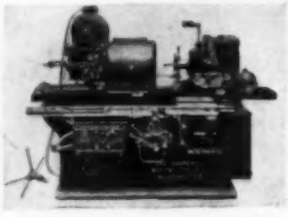
wheel slide and drives the wheel spindle direct. The second is arranged horizontally on the slide for driving the planetary motion, and the third is coupled direct to the oil pump for the "Oil-Aulic," which gives reciprocating motion of the wheel slide. The total power of the three motors is 5 hp.

Specifications: maximum internal diameter ground, 8¾ in.; maximum depth, 15¾ in.; spindle head traverse, 23⅝ in.; eccentric adjustment of spindle, ¾ in.; spindle speeds, 3,000 to 6,000 r.p.m.; vertical traverse of spindle head, to 3.3 in. per sec.; working surface of table, 37⅛ by 17¾ in.; longitudinal table adjustment, 33½ in.; traverse adjustment 7⅛ in., and net weight, 7,280 lb.

Grinder, Internal, Hydraulic, "Intermatic," Improved

Churchill Machine Tool Co., Ltd., Manchester, England. [Vol.73,p.5E.] 38.

Improvements have been made in the "Intermatic" grinder, which is intended for automatic rapid internal grinding of holes without the use of plugs or gages. The machine is suitable for large and small quantities and for parallel or taper holes,



which may be through or blind and without or without keyways. An automatic sizing mechanism is fitted.

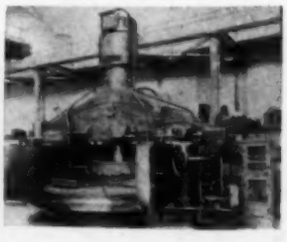
The maximum hole capacity is 10 in. diam. by 11 in. long, the maximum swing inside the water guard being 14 in., or over the table with the guards removed, 19 in., and the holes can be maintained in size within limits of 0.0002 to 0.0003 in. Stops for controlling the traverse and automatic feed are mounted on the front of the table. For taper grinding the workhead swivels on a double base, coarse adjustment being up to 30 deg. included angle.

The 1¼-in. hole through the spindle accommodates the chuck-operating tube, through which also passes a coolant supply pipe. Drive to the work headstock is by independent 1-hp. motor. The cross-slide for the wheel spindle has fine and coarse cross adjustments. The machine can also be equipped for grinding faces at either end of a ground bore.

Grinder, Surface, 9-Ft.

Alfred Herbert Co., Coventry, England. [Vol.73,p.35E.]

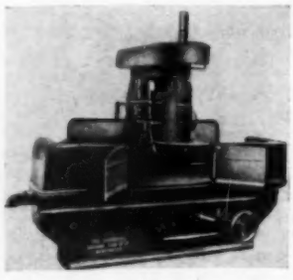
This large Lumsden heavy-duty surface grinder has capacity for work up to 9 ft. in diameter. The bridge-piece is mounted on four adjustable supports, to enable correct alignment of the grinding wheel with the table. The segmental grinding wheel is mounted on the flange of the spindle, which is driven by a 60-hp. vertical motor. Vertical movement of the cylindrical ram provides the feed motion to the grinding wheel. The feed can be tripped at any desired position. The table is mounted on flat circular ways and rotated by a central ball-bearing pivot, the drive being supplied by an 8-hp. motor. The table is 100 in. in diameter, and the wheel is 50 in. in diameter.



Grinder, Surface, Vertical-Spindle, Hydraulic

Churchill Machine Tool Co., Ltd., Broadheath, Manchester, England. [Vol.73,p.146E.] 89.

This machine carries a 24-in. segmental wheel and is made in six standard lengths of bed, suitable for tables with working surfaces up to 120 in. by 22 in., the traverse of the table then



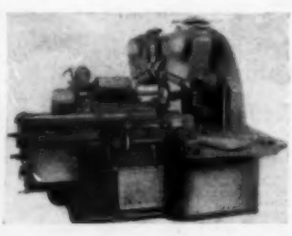
being 138 in. and the net weight of the machine about 32,000 lb. The maximum height ground above the table is 20 in., the minimum height being zero. The automatic down-feed ranges from 0.00025 in. to 0.003 in. per stroke. The recommended motor size is 50 hp.

The traverse motion of the table is obtained hydraulically at all speeds up to 50 ft. per min.

Grinder, Helical-Gear, Automatic

Sulzer Bros., 31 Bedford Square, London, W.C. England. [Vol.72,p.264E.] 8.

This machine is built by the Maag Gear-Wheel Co., Ltd., Zurich, Switzerland, for grinding helical gears of a maximum diameter of 8¾ in., the minimum pitch diameter being 1 1/16 in., and the maximum and minimum module ground being 6 and 2. The maximum helix angle is 30 deg., the maximum width of gears that can be dealt with being 5½ in. The machine is based on the firm's automatic



grinder for spur gears described and illustrated in the European section of the review issue.

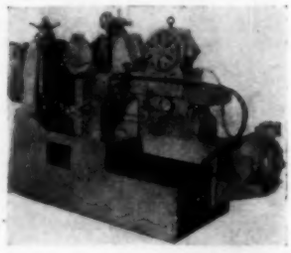
Drive to the worktable is by a 1-hp. motor and five-speed cone pulleys, the range being from 120 strokes to 200 strokes per min., and the eight feeds are variable by pick-off gears.

Completely automatic operation is a feature, including the change from rough- to finish-grinding. The column carrying the grinding wheels can be swiveled to the angle required.

Grinders, Gear, Hydraulic

Gear Grinding Co., Ltd., Soho, Birmingham, England. [Vol.72,p.338E.] 32.

These machines have been improved since the first description on Dec. 11, 1926, of the Colonial Edition. These improvements are summed up by the use of the hydraulic drive throughout. The machine works on the copying principle rather than generating the tooth forms, a profile abrasive wheel grinding the sides and bottoms of the teeth. The abrasive wheels are kept true to shape by means



of two cam plates operating pantograph systems, with the necessary truing diamonds, a third diamond with independent drive being employed to shape the outer edge to give the required depth of tooth.

Adjustable means are provided for quickly setting the gear in relation to the abrasive wheel, and the abrasive wheel spindle can be adjusted vertically to scale for the desired feeds.

Grinder, Tap and Thread

Dowdings' Machine Tool Co., Ltd., Albert Embankment, London, S.E., England. [Vol.73,p. 24E.] 48.

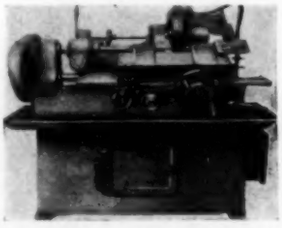
This Lindner thread grinder will grind correctly all elements of the thread at one contact with the grinding wheel; that is, a complete thread is formed from the blank, including the correction of the flank for the helix angle and cresting. The machine employs a multiple-profile wheel. Setting can be made for what is termed a first grinding operation and another setting for a second grind. On ordinary commercial tap production, the thread is finish-ground at the first grind from

the fluted blank on the plunge-cut principle, the whole length of the tap being ground at once by a straight in-feed of the wheel and by one revolution of the work, one lead being made. A total length of 12 in. may be threaded without any marks or change in pitch. Automatic features further provide for high rate of production with little time taken for adjustments or hand motions. A motor of 10 to 12 hp. is required for driving. The net weight of the machine is 5,000 lb.

Grinder, Thread Improved

Atkins (Peterborough), Ltd., Old Fletton, Peterborough, England. [Vol.73,p.204E.] 111.

This thread grinder of improved design still employs a grinding wheel having the periphery formed by means of a diamond and pantograph device. The full thread form is produced in one operation. The nominal capacity of the machine is 8 threads per in., 9 in. long by 1 in. in diameter, but it takes 10 in. between centers without overhang, and can grind up to



3 in. diam. with worn wheels. The standard wheel diameter is 10 in. Change gears provide for pitches from 8 to 40 per in. and from 0.5 to 3 mm. metric and up to 5 B.A., the helix angle being up to 4 deg. each way. The grinding wheel has six speeds and the speeds of traverse number six also. The table for the work supports is inclined.

In unison with the work spindle, a shaft at the rear provides a relieving motion, the cam being changed quickly. The same shaft actuates another cam which withdraws the wheel from the work at the end of the cutting stroke and returns it at the beginning of the cutting stroke. Another arrangement is provided for automatically adding the cut of any desired value and for any number of cuts so that the work can be finished automatically throughout.

Grinder, Cylinder, Horizontal

United Machine Tool Co., Ltd., Gray's Inn Road, London, W.C., England. [Vol.72,p.276E.] 10b.

This horizontal cylinder-grinding machine, built by Friedrich Schmaltz, G.m.b.H., Offenbach, Germany, has an all-electric drive. The work rotates. The bed is nearly 20 ft. long and carries a non-traversing headstock with faceplate on its left end. A machined track on the right-hand portion of the

bed carries the grinding wheel slide. With this machine, the work is rotated in the faceplate while the grinding wheel slide carries out the longitudinal feed motion. Work is held at one end by interchangeable jaws in the faceplate. The opposite end of the work is supported in a steadyrest.

Specifications: maximum diameter ground, 8 in.; maximum length, 4 ft. 5½ in.; maximum length of work admitted, 5 ft. 3 in.; work speeds, 3; longitudinal feeds, 6; and maximum power of 4 motors, 19 hp.

Grinding and Quartering Machine, Crankpin, Locomotive

Craven Bros. (Manchester), Ltd., Reddish, near Stockport, England. [Vol.73,p.12E.] 39.

This electrically-driven machine is for dealing with locomotive outside crankpins, right-hand leading only. It will true up worn crankpins at exact quarter centers when assembled

with the wheels and axles, after the Walschaert levers have been removed from the pins, and it is designed to quarter coupled wheels of standard-gage locomotives of all classes; to bore wheel centers for the crank and coupling-rod pins; and to return and grind the pins when in position on the wheel centers mounted on their axles.

It has two heads which will grind simultaneously, and both the grinding headstock standards are adjustable along the bed. Dead stops are provided to suit the various crankpin throws. Each headstock is driven independently by a 5-hp. constant-speed motor.

The machine can also be used for drilling and boring crankpin holes in new wheel centers. The machine will admit wheels up to 7 ft. on the tread on axles up to 6 ft. long, and will deal with crankpins up to 8 in. diam. by 15½ in. over-all length and from 11 to 15-in. throw. The self-acting longitudinal traverse of the grinding head is 8 in.

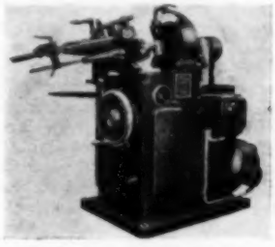
Weight, exclusive of electrical equipment, 24,000 lb.

Grinder, Drill, Oscillating

Loranco Ltd., 65a, Fenchurch St., London, E.C., England. [Vol.72,p.317E.] 24a.

Automatic oscillation of the grinding wheel is a feature of this machine, which has a flange motor at the rear that drives a lower internal shaft coupled to the wheel spindle by a belt. The electric control gear is mounted immediately above on the right-hand side. In addition to the rotary motion, the wheel has a variable oscillating movement for retaining a true grinding face. This movement is effected by an oil drive.

The wheel head also has a cross movement to and from



the drill. The drill holder is adaptable for grinding two-, three- or four-fluted drills to any point angle from 50 to 175 deg. A swinging arm carries the holder, and the handle allows the drill to be swung around to give the required cutting clearance to the drill point.

Grinder, Drill, Point Thinning

Loranco Ltd., 65a, Fenchurch St., London, E.C., England. [Vol.72,p.318E.] 24b.

Point-thinning is done on this machine, which has self-contained tight and loose pulleys mounted on a backshaft and

belted to the grinding wheel spindle. The wheelhead is carried on a counterbalanced swinging frame whereby the wheel is fed down to the drill point by means of a handle, an adjustable screw stop controlling the movement.

Grinder, Drill, Hydraulic

Farmer, Stedall & Co., St. John St., E.C., London, England. [Vol.73,p.133E.] 84.

This improved stock twist drill grinder with oil-gear reciprocation to the wheel has a self-contained drive from a motor carried inside the column. The oil-gear unit is situated just below the grinding wheel, and its position brings the controls in line with those for the drill

holder. The amount of reciprocation can be changed with the machine running.

In smoothing and equalizing the cutting edges of the drill, the reciprocating motion is stopped with the grinding surface of the wheel definitely opposite the cutting edge of the drill. The drill holder is mounted on a separate pedestal with splash tray. The holder unit is fed to and from the wheel by the large handwheel in front. Adjustment is provided for any angle of drill point from 100 to 140 deg.

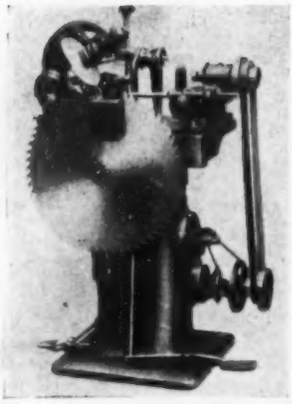
The machine deals with drills from ⅛ to 3 in., the power required is 3 hp., and the net weight is 1,695 lb.

Grinder, Saw, Automatic

C. D. Monninger, Ltd., 59, Farringdon Road, London, E.C., England. [Vol.72,p.307E.] 22.

Wood or metal saws can be sharpened with little adjustment in this machine. Drive for all movements is taken from a self-contained shaft at the foot. The lower cone is connected by belt to a wormgear box that transmits motion to a cam shaft controlling the movement of the grinding wheel. A separate cam is used for each shape, although a variety of pitches can be obtained for the same shape of tooth. The wheelhead is mounted in a swinging frame, the pivot center being also adjustable to vary the front cutting angle of the tooth.

Circular saws are mounted on



a vertically adjustable arbor, with interchangeable hardened steel bushings. The edge of the saw is supported by the steel faces of a small vise.

Attachments are also available for dealing with bandsaws and frame saws.

Grinder, Saw

Buck & Hickman, Ltd., Whitechapel Road, E., London, England. [Vol.72,p.331E.] 31.

This machine is made by the firm of Charles Wicksteed & Co., Ltd., Kettering. It will take saws from 10 to 36 in. diameter, the minimum and maximum pitch of the teeth being ¼ and 2 in., and the minimum bore for the saw, 1 in.

The slide carrying the saw holder has horizontal adjustments in two directions at right angles and also vertical adjustment. The wheel arm is given the necessary vertical motion by a cam. Cam action also provides for the indexing, adjustable to pitch. The grinding wheel is 7½ in. in diameter by ½ in. thick.

Floor space, 3 ft. by 2 ft. 1 in., and net weight, 550 lb.

Grinder, Tool and Cutter

Alfred Herbert, Ltd., Coventry, England. [Vol.72,p.248E.]

This machine, manufactured by L. Kellenberger & Co., St. Gallen, Switzerland, may be used as a special machine for tool and cutter grinding only or with attachments as a universal grinder. It can be operated from any of four positions, two at the front and two at the back.

The grinding head consists of two parts, the upper portion including the ½-hp. motor being detachable. Position of the grinding wheel can be adjusted vertically by means of a hand-wheel. The spindle carries two wheels. The grinding head-

stock swings in a complete circle and the slide carrying the headstock can be adjusted to or from the work.

The work headstock can be arranged with a motor for driving cylindrical work, and both internal grinding and surface grinding attachments are available. All motions are hand-operated. Maximum distance between centers is 29½ in., height of centers, 6 in., maximum swing over table, 12½ in.; movement of table by hand, 28½ in.; vertical movement of grinding headstock, 11¾ in., and cross motion of grinding headstock, 15¼ in.

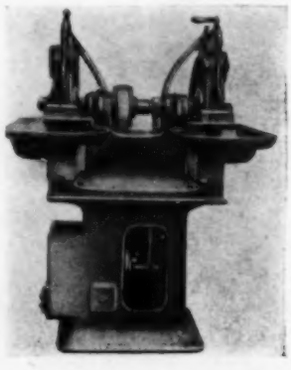
Net weight, 1,230 lb.

Grinder, Tool, Tungsten-Carbide, Double-Wheel

Selson Engineering Co., Ltd., Charles St., London, E.C., England. [Vol.72,p.279E.] 14.

The firm of Fritz Wunderli, Uster, Switzerland, is the manufacturer of this machine carrying two wheels designed for grinding tungsten-carbide tools. The wheels are of the same size but of different grades, for roughing and finishing. An abundant supply of water is provided, and the grinding operation is hand-controlled.

Machines of this type are driven either by pulley and

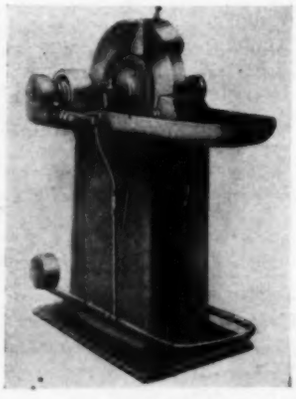


countershaft or by electric motor. Two spindle speeds can be obtained with the belt drive. The machine is available in two sizes, one to take wheels 13¾ in. diameter by 2¾ in. wide, and the other 15¾ in. diameter by 2¾ in. wide, the smaller machine running at 1,400 to 1,700 r.p.m., and the larger at 1,200 to 1,500 r.p.m. Power required, 2½ hp.

Grinder, Tool, Wet, Pedal-Controlled

Selson Engineering Co., Ltd., Charles St., London, E.C., England. [Vol.73,p.106E] 79.

The above concern represents Fritz Wunderli, Uster, Switzerland, manufacturer of this wet tool-grinding machine, in which the rotation of the wheel is controlled automatically by a pedal, the drive being direct by a

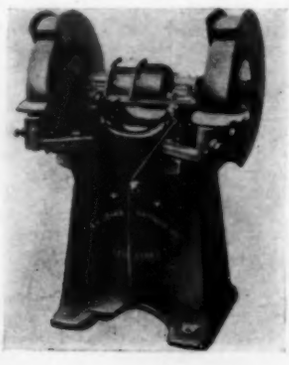


belt to a friction-clutch pulley. When the counterweighted pedal is depressed, the clutch is operated and the pulley drives the wheel shaft. Thus, when the workman removes his foot from the pedal, the clutch is disconnected and a brake is engaged which brings the grinding wheel to rest. The machine carries a wheel 20 in. by 2½ in. Power required is 1¼ hp.

Grinder, Floor-Stand, Self-Stopping

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 57E.] 61.

Automatic return of the belt fork to the loose-pulley position when the machine is unattended

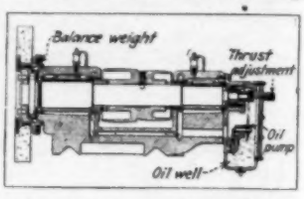


is a feature of this grinder. In order to start the machine the operator has to press a pedal, which pulls the belt fork over to the driving position. Spring action returns the belt fork to the loose-pulley when the pedal is released.

Grinding Wheel Head, Improved

Churchill Machine Tool Co., Ltd., Broadheath, Manchester, England. [Vol.73,p.23E.] 46.

The above concern has recently adopted this improved design of grinding-wheel head for use on its plain grinding machines. The principal features include the use of large

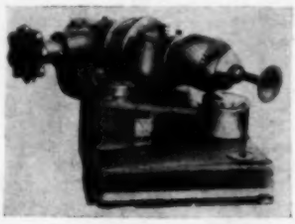


plain bearings lubricated by pump supply specially designed to avoid transmitting pulsating action to the film between the shaft and the bearings. The bearing bushings are split and have finger adjustment by external knurled screws. End adjustment by screw is provided to the spindle. At the wheel end a seal ring prevents ingress of water and dust. A wheel collet of balancing type is mounted on the shaft. Another feature is the short center height above the inverted V-slides.

Grinding Head, Valve

Jones & Shipman, Ltd., Leicester, England. [Vol.73,p. 160E.] 93.

The head illustrated enables valves to be ground from approximately 1 to 2¾ in., of varying angles from 30 to 60 deg. on their standard precision grinding machines. The head can be mounted on the 12x6-in. tool and cutter grinder, 16x6-in. uni-

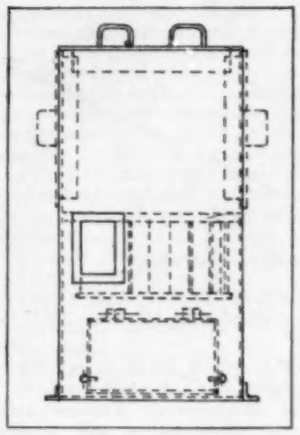


versal grinder, and 18x8-in. universal grinder. For determining the exact angle the device has a graduated base locked in position by means of a bolt. The valve is held in a chuck with a hollow body, through which the valve stem passes, enabling the valve to be gripped close to the head. By means of a dog clutch the valve can be stopped or rotated at will.

Dust Collector for Grinders

Visco Engineering Co., Ltd., 162, Grosvenor Road, London, S.W., England. [Vol.73,p.90E.] 70.

This dust-collecting unit is designed to employ one or more of the Visco filter cells, and is built in sizes to supplement the present model with the single filter cell in front. It is of rectangular box form and may be placed close to the machine, or arranged as an integral part of the exhausting equipment. The exhaust fan may, if desired, be connected directly to the unit, dispensing with air trunking. The exhaust fan is mounted on the machine or adjacent on a pedestal, the drive being by independent motor and belt. There are four capacities, ranging from 400 to 1,200 cu.ft.



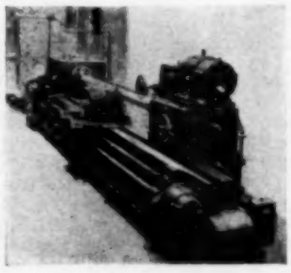
per min. The cross-sections of all casing are the same, 20 in. sq., the heights varying from 2 ft. 9 in. for the smallest to 3 ft. 6 in. for the largest.

Lathes

Lathe, Engine, High-Speed, 15-In. Centers

J. Holroyd & Co., Ltd., Milnrow, Rochdale, England. [Vol.72,p.330E.] 30.

This lathe with its 15 in. height of centers is intended particularly for use with "Widia" metal. The bed is 23 ft. long and admits work up to 11 ft. long, the maximum diameter turned being 20 in. and the maximum diameter cut off 14 in. Main drive is by a 45-hp. variable-speed motor, giving spindle speeds ranging from 66 to 400 r.p.m. Sliding feeds,



with six changes, range from ¼ to 1/42 in. per revolution, and surface feeds, also with six changes, are at half these rates.

Centralized push-button control is provided on the saddle. The tool cuts in the upside-down position, and the turnings fall to the rear. Chucks bolted direct to the flanges of the spindles of the fast and loose headstocks secure the work.

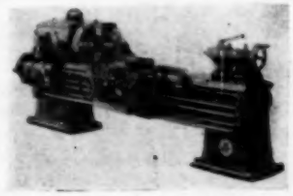
The loose headstock can be arranged for boring purposes with the 7½-hp. motor drive and variable automatic feed for such purposes as boring-out ends of shafts.

Floor space, 34½x6 ft.

Lathes, Engine, Hydraulic

Dowding & Dickinson, Greycoat St., Westminster, S.W., England. [Vol.73,p.14E.] 41.

The Magdeburg Machine Tool Works, Magdeburg, Germany, represented by the above concern, has made several improvements in the Lauf-Thoma unit on its hydraulic lathes. By means of a handwheel on the front of the headstock or on



the right-hand side of the apron, the spindle speed may be changed by hand without steps and read off on a tachometer. Automatic control of the spindle speeds is effected in conjunction with the surfacing feeds, so that over the whole range of the surfacing movement approximately uniform cutting speed is attained. The same mechanism also operates when setting the cross-slide to different turning diameters for sliding, the spindle speed then being changed similarly automatically.

Lathes, Engine

Dowding & Dickinson, Greycoat St., Westminster, S.W., England. [Vol.73,p.34E.] 50.

The above concern is agent for the Magdeburg Machine Tool Works, Magdeburg, Germany, for a range of high-performance lathes built in sizes between 16 and 34¾ in. swing over the bed, with two different kinds of headstocks and feed gearboxes. The sliding-gear headstock gives 18 speeds, right and left, through the three change-speed levers and 19 sliding gears. The spindle speed is shown on a tachometer and the performance indicated on an ammeter.

The lathes can also be fitted with the Lauf-Thoma hydraulic headstock drive and a plain feed

box. The lathe spindle may be driven at any speed between zero and 800 r.p.m. Automatic cutting-speed control has been attained by coupling the cross adjustment of the cross-slide with the spindle speed control. The spindle speed is thus altered so that approximately uniform cutting speed is obtained for all diameters.

Lathe, Engine, Heavy, 25-In.

Hulse & Co., Ltd., Manchester, England. [Vol.73,p.56E.]

In addition to the ordinary functions, this lathe has been arranged for dealing with the cutting of the interrupted threads on the breech blocks and bushings of heavy guns. The bed is a heavy box casting carried on the foundation along its whole length, with two wide square shears at the top. The headstock is driven direct by a

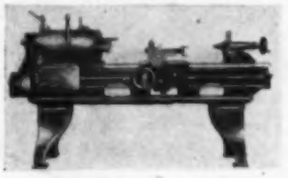
35-hp. motor running at 300 to 900 r.p.m. On the front end of the spindle is forged a large collar to which the faceplate is bolted. Immediately behind the rear spindle bearing is a set of gears which drive to the back of the lathe and control a further set of change gears between fixed centers. These gears control a shaft running along the back of the bed to provide the necessary rotation to the tool-rest for dealing with stepped threads. These gears control the number of cycles which the tool must make per revolution of the work. The lathe admits 12 ft. between centers and swings 37 in. over the carriage. Its weight is 23 tons.

Lathe, Toolroom, 13-In.

T. S. Harrison & Sons, Ltd., Heckmondwike, England. [Vol. 73,p.176E.] 101.

A 13-in. swing all-geared, single-pulley drive, toolroom lathe is illustrated. It has a straight bed, whereas a similar lathe is available with cone-pulley drive and a gap bed. The lathe admits work 3 ft. between centers, and swings 9½ in. diam. over the saddle, whereas in the case of the gap lathe it swings 24 in. in the gap by 6½ in. wide. The bed is 6 ft. long.

The steel spindle has a 1⅝ in. hole right through, and the



16 spindle speeds range from 23 to 485 r.p.m. The tailstock may be set over by screw. The feed gearbox has steel gears throughout and provides 32 threads and feeds, raising from 8 to 112 cuts per in.

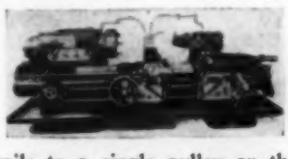
Floor space, 7 ft. by 2 ft.; power required, 1½ hp.

Lathe, Turret Combination

E. H. Jones (Machine Tools), Ltd., Baldwin Terrace, Islington, N., London, England. [Vol. 73,p.81E.] 69.

The above concern is agent for Gebrueder Boehringer, Goeppingen, Germany, and is marketing four sizes of combination turret lathe for chuck or bar work. The smallest lathe swings 19¼ in. over the guides for the cross-slide of the saddle, 15¼ in. over the cross-slide, and 10¼ in. over the flat cross-slide for bar work, while the corresponding swings for the largest size are 28 in., 22¼ in., and 15¼ in. The smallest machine takes a 15-in., 3-jaw chuck, and the largest a 21½ in. chuck: similarly the range of spindle bores is from 3⅛ to 6⅛ in., taking bars 3 in. and 6 in. in diameter.

Rapid power traverse of the turret slide and saddle is available by a separate quick-running shaft at the front, while a taper-turning attachment can also be fitted in the front. The drive may be from a lineshaft, by countershaft or motor on slide



rails to a single pulley on the headstock, or by motor flanged to the headstock. The latter gives 18 geometrically-arranged speeds. The feeds are independent for each slide, and range in nine changes from 0.005 in. to 0.2 in. per rev. longitudinally, and from 0.003 in. to 0.1 in. for cross feed of saddle-slide. The four-way toolpost is mounted on a rigid base, or it may be mounted on a slide on either a fixed or swivel base.

Lathe, Turret, Double-Ended, for Buffer Parts, 12½-In.

J. Holroyd & Co., Ltd., Milnrow, Rochdale, England. [Vol.73,p.163E.] 98.

This 12½-in., double-ended, turning, boring and facing lathe will do the work of two combination turret lathes, and is built for machining various parts connected with carriage and wagon buffer units. The lathe has special back and front tool-slides, the front slides

being arranged for straight and form facing, while the back slides are for straight turning and boring. The saddle being clamped to the bed, the front and back tool-slides work simultaneously and have independent automatic trips. In addition, each saddle has automatic longitudinal feeds.

On a bed 19 ft. long the distance between the spindle flanges is 12 ft. The machine will face up to 24 in. in diameter. The headstocks provide 12 spindle speeds ranging from 240 down to 6¾ r.p.m., and each spindle is bored through 3⅜ in. The front tool slides each carry a steel turret for four tools, and have automatic cross-feed for facing.

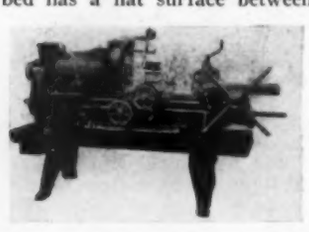
Floor space occupied, 7 ft. by 21 ft. 6 in.; weight, 8¾ tons.

Lathe, Capstan, 15-In.

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.79E.] 66.

This capstan lathe has a swing of 15 in. in diameter over the bed covers, or 8 in. over the cross-slide. Maximum distance from the spindle to the face of the capstan is 29 in., and the working stroke of the capstan, 9 in. It is available with a plain head, fitted with a hand or an air-operated chuck, or a draw-in chuck for bar work up to 1⅜ in.

The right-hand end of the bed has a flat surface between



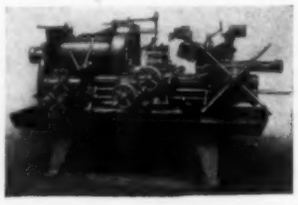
the ways for the saddle to which the lower capstan slide can be bolted at any desired distance from the headstock. The chuck can be bolted direct to the headstock spindle, an adapter being attached to the spindle flange to carry the chuck jaws when a draw-in chuck is fitted. A hexagon stop bar is provided for the longitudinal motion of the saddle, the bar being indexed by handwheel with locating plunger.

Floor space with plain head 7 ft. 8 in. by 4 ft. 2 in., or 11 ft. 6 in. by 4 ft. 2 in. with draw-in chuck and bar feed. Net weights, 2,250 lb. to 2,550 lb.

Lathe, Capstan, No. 5B

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.191E.] 108.

The No. 5B capstan lathe is suitable for small bar and chuck work. It swings 15 in. over the slide covers, 8 in. over the cross-slide, the maximum distance from the spindle end to the face of the capstan being 29½ in., and the hole through the spindle 2 1/16 in. diam., the largest bar admitted through the draw-in chuck being 1⅜ in., and the working stroke of the capstan, 9 in. Among the special features are the automatic sliding and surfacing motion to the



saddle independent of the capstan slide, and the simple arrangements for feed-changing.

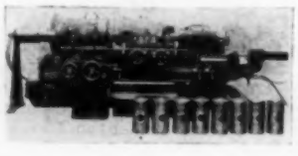
The spindle nose is flanged to support chucks with minimum overhang, while an integral projection is provided at the rear of the spindle for carrying an air cylinder or draw-in chuck mechanism. The cross-slide is of sufficient length to permit turret tools to work between the front and back toolposts, while a 12-in. chuck can be carried on the spindle without obstructing the travel of the saddle. An overhead bar supports combination and knee tools on the turret.

Lathe, Semi-automatic, Multi-Tool

Gebr. Heinemann A.G.,St. Georgen, Black Forest, Germany. [Vol.73,p.162E.] 96.

This special lathe is an adaptation of the well-known multi-tool lathe of 9¾ in. height of centers manufactured by the above concern. It has a spindle bore of 4⅛ in., and eight speeds are available. Drive is by a 20-hp. motor.

This special lathe has been designed principally for rapidly turning the larger components of motor cars, motors, shafts

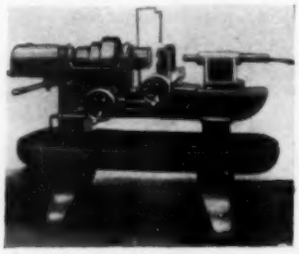


for electric motors, railway buffers, and is specially suited for turning relatively large pistons, such as Diesel engine pistons. The expanding mandrel carrying the piston is actuated by an air cylinder, two sets of jaws being used, one in front and one at the rear. The tailstock is also connected with compressed-air cylinders.

Lathe, Shaving

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.205E.] 112.

For second-operation, capstan-lathe work, the above concern has developed a machine for doing one or two simple facing or ending operations. The centers are 7 in. high, the bed is 4 ft. long, the hole through the



spindle is 2 in. diam., and the maximum size taken in the automatic chuck is 1½ in. Maximum traverse of the saddle along the bed is 5¼ in., the maximum distance between the toolposts is 12 in., and the movement of the tailstock barrel, 6 in. The automatic chuck is of the stationary spring collet type.

Lathe, Railway-Wheel Motor Driven, 90-in.

Alfred Herbert, Ltd., Coventry, England. [Vol.72,p.249E.] 3.

Five sizes of the motor-driven railway-wheel lathes are manufactured by Noble & Lund, Gateshead, England, in models from 37 to 90 in. The single-purpose machines are intended for turning new and worn wheel tires with the wheels mounted on their axles, the saddles and tool slides having a small cross movement to suit the different sizes. In the general purpose machines, the saddle can be moved up to the cen-

ter of the machine for boring wheel centers and facing bosses.

Both models may now have continuous feed motion changed by handwheel at the front of each rest. Each saddle also has a single feed lever. The driving gearbox is placed in front of the lathe.

Lathe, Railway-Wheel 3 Ft., 9 In.

J. Hetherington & Sons, Ltd., Manchester, England. [Vol.73, p.13E.] 40.

Rapid production of re-turned railway wheels up to 3 ft. 9 in. diam. on the tread can be obtained on this lathe, the maximum distance between the faceplates being 9 ft. 4 in. The bed is of step pattern. Main drive is by a 50-hp., constant-speed

motor, a gearbox giving six speeds. The headstocks carry faceplates 4 ft. 3 in. diam. and have spindles and sliding barrels to take collets for gripping the axle journals. The loose headstock is adjusted along the bed by a 10-hp., constant-speed, reversing motor.

The feeds give six picks per revolution of the faceplates. When loading the lathe, the wheels can be rolled on to a slide provided for the purpose and fitted on the bed between the headstocks. The axles are run into position on this slide and the loose headstock can then be run up without further manipulation of the wheel set, stops insuring that the axle journals are in line with the headstock centers. The drives are suitable for spoke, plate, or wood-center wheels and can be instantly engaged or released.

Weight, 36 tons.

Lathe, Railway-Wheel, Double

Craven Bros. (Manchester) Ltd., Reddish, Stockport, England. [Vol.73,p.45E.] 54.

This extra-heavy, duplex, railway-wheel lathe is designed for turning simultaneously, without torsional strain on the axle, a pair of railway wheels from 2 ft. 10 in. to 3 ft. 10 in. on the tread, when mounted on the axle at 5 ft. 6 in. gage. It will admit axles up to 8 ft. 6 in. long. Output: a pair of wheels in 15 min. floor-to-floor time.

The lathe is arranged for drive by 50-hp., d.c., variable-speed motor, and is fitted with

two front rests of the turret type. Like the turret rests, the loose headstock clamps are pneumatically operated. The total length of the bed is 22 ft. An extension is cast with it at the front for carrying the slide rests, and has a planed top.

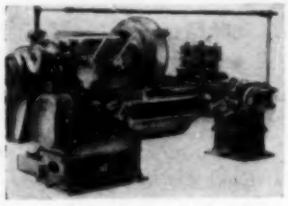
Each spindle is arranged to take cast-iron split bushings for carrying the axles by the journals. The loose headstocks have power adjustment along the bed. Each faceplate is fitted with four drivers having serrated plates of the taper sliding type which adjust themselves to the wheels. They are suitable for wheels with disk or open-spoke centers and drive. Cutting speeds range from 10 to 20 ft. per min. The range of feeds is approximately ⅛ to ¼ in.

Net weight, exclusive of electrical equipment, 29½ tons.

Lathe, Boring, 24-In.

G. Swift & Sons, Ltd., Halifax, England. [Vol.72,p.291E.]

This lathe, adapted for using tungsten-carbide tools, swings 25 in. over the bed and admits 2 ft. 9 in. between the chuck and turret face. The square-edge gap bed is 8 ft. 3 in. long. In the all-geared headstock sliding gears provide 18 spindle speeds from 340 to 4 r.p.m. The shafts run on ball-jointed



bearings and those for the sliding gears have six-splines. The spindle has a 4-in. hole right through for bar work.

The hexagon turret has cross movement for surfacing. An adjustable stop at the back of the saddle locates the central position for boring. Each turret face is 8½ in. by 6 in. deep and the holes in the turret are 3¼ in. The four feeds vary from 24 to 96 cuts per in. All regular threads from 1 to 38 per in. can be cut, and the reverse motion for cutting right- and left-hand threads and for sliding and surfacing is self-contained in the gearbox. Drive is by a 7½-hp. motor.

Floor space, 10 ft. by 5 ft.; weight, 7,100 lb.

Lathe, Taper-Turning, for Valve Work

Stanley Machine Tool Co., Ltd., Halifax, England. [Vol. 73,p.118E.] 80.

This machine is a 10½-in. center lathe for valve work. It will turn a taper 24 in. long either on the inside of a valve or on the plug and will take

valves ranging from 6 to 30 in. in diameter. The special features are the sliding bed and the taper-turning attachment.

The lathe admits work 40 in. long between centers when the sliding bed is brought up to the faceplate, and the sliding bed can be moved to admit work 20 in. wide in the gap. It swings 21 in. over the bed, 16 in. over the saddle and 38 in. in the gap. The slide is graduated to turn a 15 deg. included angle.

Chuck, Concentric, Two-Jaw

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.105E.] 77.

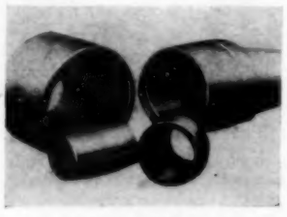
This 9-in. chuck with two jaws is similar to the Coventry concentric chuck and can be obtained for either hand- or air-

operation. The body is in one piece and all working parts are enclosed. By easing the jaw screws half a turn, the jaws can be set in any position on the jaw slides.

Chuck, Collet, Improved

Clare-Collets, Ltd., Thomas St., Cheetham Hill, Manchester, England. [Vol.73,p.132E.] 83a.

This chuck has been improved by the use of a double-cone in place of a single-cone collet. The double-cone collet is operated by a loose cone thrust cap

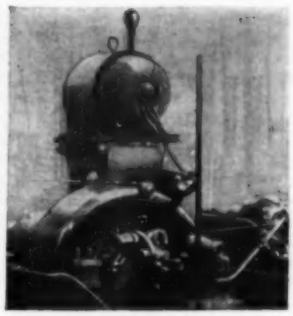


screwed left-hand into the body of the chuck. By this means the collet is compelled to close on both ends of a shank.

Tell-Tale Lamps on Auto-Lathes

Alfred Herbert, Ltd., Coventry, England. [Vol.73,p.147E.]

These tell-tale lamps or indicators show at once when any given machine or machines in a set of Auto-Lathes needs reloading. The system reduces the idle time of the automatic to the minimum, and it has the further advantage for the operator of reducing the walking required to inspect machines under his control. The lamp is controlled by a switch which is operated by a cam attached to the speed-control drum. The lamp is cut out during the actual machining operation, but when an auto-lathe requires recharging, the lamp lights and remains lit until the machine is restarted after loading.



Milling Machines

Milling Machine, Keyway

Ward, Haggas & Smith, Keighley, England. [Vol.73,p. 23E.] 45.

This machine will mill keyways up to 6 ft. long by 2½ in. wide. The vertical column and milling head have a horizontal traverse of 7 ft. The table is 7 ft. long by 18 in. wide. Feeds in cuts per in. range from 11 to 78. An automatic stop is provided for the feed in one direction only. The balanced saddle

is adjustable by hand up and down the column and carries two milling spindles, one horizontal and one vertical. The vertical spindle has reverse motion and is used for finishing the ends of keyways intended for sunk keys. The horizontal spindle has a slight adjustment in the horizontal direction.

Milling Machine, Slot and Keyway, Vertical-Spindle, Duplex

Carter & Wright, Halifax, England. [Vol.73,p.105E.] 76.

This double-head, vertical-spindle slot and keyway milling machine is for general locomotive work. The headstocks, each with a range of 1 ft. 4 in., will operate simultaneously on shafts 6 ft. long. The maximum length of slot or keyway cut by each head is 13 in., the maximum depth 11 in., and the maximum width 4½ in. The

bed of the machine is 8 ft. 10 in. long, by 2 ft. 4 in. wide and has planed T-slots which support the apron slides and two worktables. The drive is by a single pulley through a gearbox giving six spindle speeds to each head, varying from 56 to 520 r.p.m.

Quick hand, fine hand, and self-acting down feeds are provided to each spindle. The worktables, 2 ft. 11 in. long by 12 in. wide, have both vertical and transverse traverse by means of hand levers and screws and can be adjusted longitudinally across the front of the bed. The distance from the center of the spindle to the front of the apron is 8½ in.

Floor space, 13 ft. long by 6 in. wide; weight, 6 tons.

Milling Machine, Special, Four-Spindle, Front-Axle

J. Holroyd & Co., Ltd., Milnrow, Rochdale, England. [Vol. 73,p.177E.] 104.

This four-spindle, horizontal milling machine is designed for machining motor-car front-axles, a gang of milling cutters being carried on right- and left-hand heads and milling each

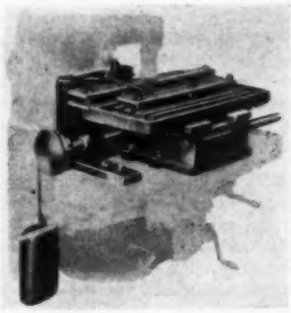
side of the axle simultaneously, the work jig remaining stationary. The cutter headstocks have automatic traverse by means of drum cams, giving a quick forward traverse, a slow feed, and quick return.

Milling Attachment, Cam, Longitudinal

United Machine Tool Co., Ltd., Gray's Inn Road, London, W.C., England. [Vol.72,p. 306E.] 21.

This longitudinal cam milling attachment is designed particularly for use on Mueller & Mon-

tag vertical milling machines, but can be used on other makes. It consists of a base bolted to the table of the machine and carrying the worktable on transverse bearing surfaces. In addition to the workpiece, the table carries also, along its rear edge, a master plate of the shape to be reproduced. The range of attachments available covers milling lengths from 14 5/32 in. to 55¼ in. and transverse movement of the cam table from 2 1/32 in. to 11 3/32 in.

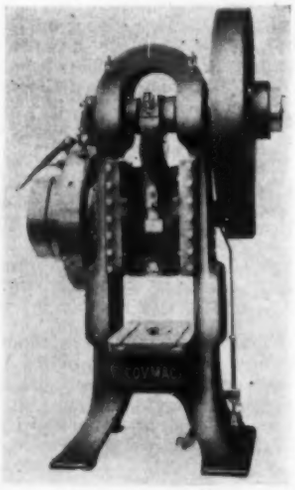


Presses

Press, Single-Crank, Double-Sided

Coventry Machine Tool Works, Ltd., Coventry, England. [Vol.73,p.160E.] 94.

This double-sided, single-crank press is suitable for stamping, finning, forming, bending, and drawing operations and general press work. Transverse slots above the table allow material to be fed in from the side. A central hole is provided in the main table and may be either circular or of any shape required for special work. A loose table is also available.



The machine is driven by belt, but a motor may be applied to a rear bracket. An automatic brake holds the carriage in the top position after the driving key has been disengaged. The carriage can be adjusted vertically and may carry a toolholder with dovetail grooves or one of the quick-adjusting self-centering type. Either single or double ejectors may be supplied.

The width between the uprights is 19½ in.; the table measures 25½ by 18½ in., with 8¼ in. diam. holes, the height from the main table to the underside of the carriage in top position is 18½ in., and the stroke is 5 in. The machine makes 45 strokes per min. It weighs 8,200 lb. The maximum pressure is 120 tons.

Press, Automatic-Feed

Hunton, Ltd., Fitzroy Court, Tottenham Court Road, London, W., England. [Vol.73,p.5E.] 37.

The Weingarten automatic-feed press illustrated has a slide operating in abnormally long guides, adjusted by special taper gibs. The crankshaft actuates the slide through separate connectors, the height of the slide being adjustable by a twin-face nut. A clutch coupling operates in conjunction with an intermittent action band brake. On the larger machines a bolt coupling is fitted and may be engaged by hand or treadle.

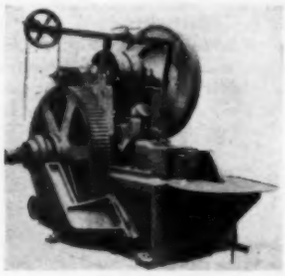
The automatic feed of the material is variable and positive. Moreover, the lubrication of the material is automatic. For such parts as stator and rotor stampings, the tools produce the finished piece at one pass, a stacking device delivering a pile of stampings for easy removal.

Machines are built with ungeared flywheel drive or with gearing. The two ungeared machines have a capacity of 30 tons and 50 tons, while the three geared machines range from 80 to 200 tons capacity. The smallest machine works at a maximum speed of 250 strokes and the largest at 75 strokes per min.

Press, Tire-Bending, Horizontal

Scriven & Co., Leeds, England. [Vol.72,p.340E.] 35.

Rim sections can be bent on this press and formed into tire rims for the automobile industry. Drive is by belt, but a direct-geared 15-hp. motor and reduction gears can be employed. A forged steel eccentric shaft and machine-cut spur gearing actuate the horizontal slide through a phosphor-bronze die. The slide face is fitted with a steel block for the steel bending die face. The internal die is carried on a cast-steel detachable head bolted to the bed.

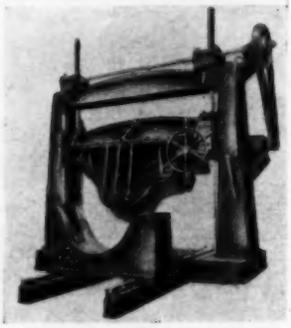


The main gear wheel is fitted with the firm's semi-automatic scroll clutch, pedal operated. When this is released the slide comes to rest automatically at the back end of the stroke. A table at the outer end of the machine supports the tire rim.

Setting-Up Machine, Press-Tool

Hunton, Ltd., Fitzroy Court, Tottenham Court Road, London, W., England. [Vol.73,p.36E.] 52.

This machine is designed specially for setting-up and correcting heavy tools for drawing and stamping, thereby saving cost of much preparatory work in production.



Two uprights with a cross beam are mounted on a base with a large slotted surface.

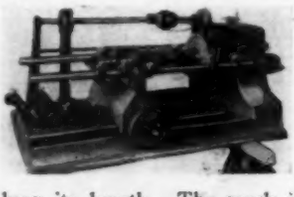
Other Machines

Balancing Machine, Dynamic

C. F. R. Giesler, Ltd., 324 Gray's Inn Road, London, W.C., England. [Vol.73,p.80E.]

This production, dynamic balancing machine is intended for automobile crankshafts and electrical rotors. It will take objects up to 280 lb. and will swing up to 18 in. in diameter and take lengths up to 52 in.

Drive for rotating the work is taken from a backshaft, a balanced swinging arm carrying a friction pulley, which is brought into contact with the work at any convenient place along its length. The work is rotated in a cradle designed for quick insertion and removal. The right-hand cradle support consists of an adjustable spring-compensated device. The left-hand support consists of a heavy slide which does not allow any floating movement, but acts as a fulcrum about which the cradle may tilt up and down, and is placed under the point where balancing is to be effected. The tilting action is obtained through a thin flat spring suspension.



By means of two indicators, the operator finds the plane of unbalance and the weight to be added.

Bandsaw, Electrically-Driven

J. Sagar & Co., Ltd., Halifax, England. [Vol.72,p.319E.] 26.

This bandsawing machine is specially adapted for pattern-makers and has an integral 3-hp. motor drive. All spindles revolve in ball bearings, the machine is fully guarded, an anti-friction saw guide is provided, and the saw pulleys are rubber-faced. The table, 2 ft. 6 in., sq., tilts for bevel sawing. Height from floor to table is 3 ft. 4½ in., and distance from the saw to machine body 2 ft. 4½ in.; depth of cut under the saw guide being 14 in.

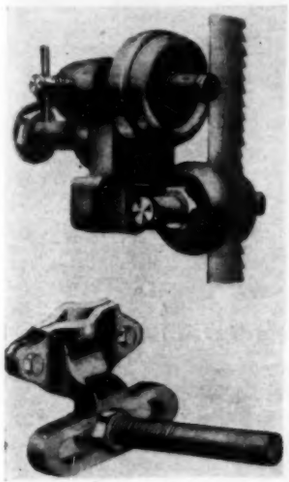
Saw tension is regulated automatically by spring and hand-wheel. A disk wheel on the saw guide takes cutting thrust and is adjusted vertically to suit timber thickness.

Floor space, 3 ft. 2 in. by 4 ft. 7 in.

Guides for Bandsaws, Ball-Bearing

Wearden & Guylee, Ltd., Bradford, England. [Vol.73,p. 93E.] 74.

Guides suitable for bandsaws of all widths from $\frac{3}{16}$ to 2 in. can be supplied. The appliance consists of three rollers, two to act as lateral guides while the bevel face of the third supports



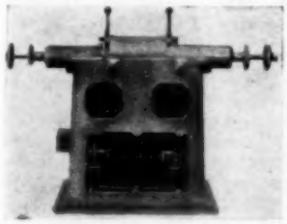
the back edge of the saw. The rollers are carried in ball bearings mounted on a back plate, from which the necessary adjustments are made, according to the width of the saw.

These guides are not only suitable for woodworking purposes, but are also used in the motor industry for saws cutting aluminum.

Buffing Machine, Electric

Chas. Churchill & Co., Ltd., London, E.C., England. [Vol. 72,p.306E.] 20.

The rear view is shown. Driving motors are completely housed in the base. The contactor gear for controlling the current supply is built-in. Each machine has two spindles driven by separate 3-hp. motors, one spindle at 2,000 r.p.m., and the other at 2,500 r.p.m. Speeds



can be varied by changing the Texrope motor pulleys. Each spindle runs in dust-proof Hoffmann ball bearings, and a Ferodo-lined brake is fitted to each. The spindles can be run together, or separately for rough and finish polishing. Polishing wheels range from 10 to 12 in. in diameter and the spindle ends are $1\frac{1}{4}$ in. in diameter. Over-all length, 6 ft.; net weight with electrical equipment, 1,350 lb.

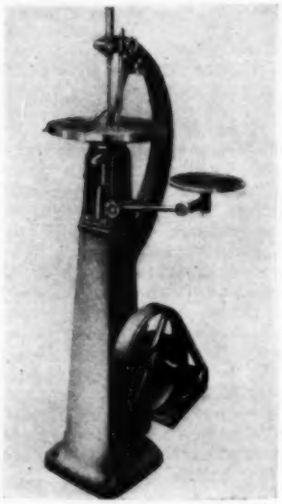
This machine is built by C. Redman & Sons, Ltd., Halifax.

Filing and Sawing Machine, Precision

Loranco, Ltd., 65a Fenchurch St., London, E.C., England. [Vol.72,p.307E.] 23.

The vertical spindle is mounted in central bearings and reciprocated by a connecting rod and crank immediately below. The crankshaft carries the driving pulley.

An outer support steadies the top end of saws and slender tools, but for a larger portion of such work a special file holder enables this support to be eliminated. When the holder is not required, a chuck with taper jaw pieces is fitted to the main spindle for taking saws and tools, which are to be supported at the top.



The stroke is approximately 2 in., and material up to 3 in. in thickness can be machined without outer support. With the support pieces, material up to 6 in. thick can be worked, while thicknesses up to 4 in. can be sawed. The table is $14\frac{1}{2}$ in. in diameter.

Flexible-Shaft Machine, Multi-Purpose

Grimston, Prichard & Plutte, Ltd., 324 Gray's Inn Road, London, W.C., England. [Vol.72,p. 292E.] 17.

The spindle head of this flexible shaft machine embodies a motor wound for d.c. or a.c. current. The head is shown mounted on a pedestal, but it can be employed as an ordinary electric hand tool. The main feature is the three spindles, one set at each end and one at right angles. The first spindle runs at 1,000 r.p.m. for drilling up to $\frac{7}{16}$ in. The second at right angles is also used for drilling, the speed of 350 r.p.m. being

suitable for $\frac{1}{4}$-in. holes. Opposite the high-speed drilling spindle is another for flexible-shaft grinding, the speed obtainable being 5,500 r.p.m. with a $2\frac{1}{2}$-in. wheel. For carrying the work, a slotted rectangular table is available, and a circular table for smaller work.

Flexible-Shaft. Machine

Flextol Engineering Co., Ltd., 18 Dartmouth St., Westminster, England. [Vol.73,p.25E.] 49.

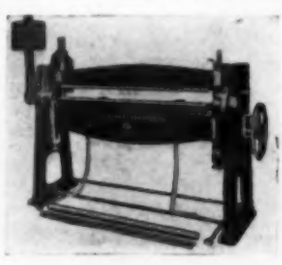
This flexible-shaft outfit consists of a motor unit, speed-change device, flexible shaft and hand-piece designed for driving the small milling cutters, rotary files, and grinding wheels used in die production.

A friction drive is incorporated with the motor and provides an infinite range of speeds between 500 and 5,000 r.p.m. Spindles are mounted throughout on ball bearings. The all-steel hand-piece weighs 9 oz. The outfit illustrated is designed for suspension.

Folding Machine, Universal, Swing-Beam

F. J. Edwards, Ltd., 406 Euston Rd., N.10, London, England. [Vol.72,p.291E.] 16.

This folding, bending, and box-forming machine will shape rounds, squares, angles, and curves. The top clamping beam

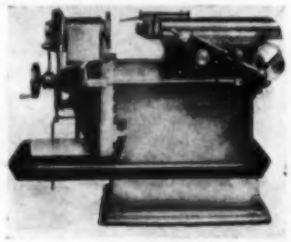


has independent screw feed and may be adjusted to the bending center or raised to a height of $6\frac{1}{2}$ in. The front bending beam carries a reversible bending blade, and the maximum adjustment is $4\frac{1}{2}$ in. A swinging motion is also provided for the top beam, so that closed sections may be removed easily. The third beam, or bottom bed also has independent vertical adjustment up to 4 in. By adjusting all three beams, tubes and channels up to $5\frac{1}{2}$ in. can be made. Weight, 1,016 lb.

Gear Shaper, Internal

Smallpeice, Ltd., Coventry, England. [Vol.73,p.192E.] 109.

This machine, manufactured by the Cromwell Engineering Co., Ltd., Coventry, is sold by the above concern and is used for notching or cutting internal or external serrations of any form, for splining and for profile shaping, and it will do much



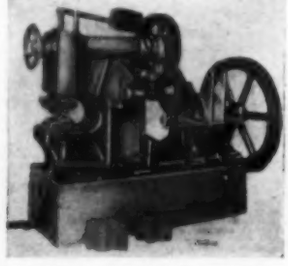
work that cannot conveniently be done in a broaching machine. A form tool is employed.

The workhead is mounted on the vertical slides at the left-hand end of the machine, and it indexes at each stroke of the ram, the cut being added at each complete rotation of the workhead. Vertical adjustment of 9 in. of the workhead is provided, and with a swiveling workhead taper cuts can be taken. The ram has a stroke of 6 in., but this can also be increased. The machine is fully automatic, feeding to dead stops.

Notching and Shearing Machine

Appleyard & Co., Boothtown, Halifax, England. [Vol.72,p. 277E.] 11.

This machine will notch six oval holes $\frac{3}{4}$ by $\frac{3}{8}$ in. at one operation, through $\frac{1}{2}$ in. mild steel plate. It will also crosscut shear flat bars up to 4 in. wide



by ½ in. thick with the special blocks shown.

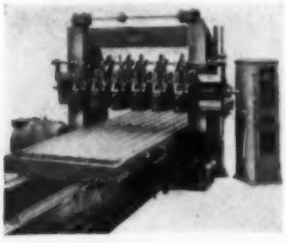
The main body casting, gearwheels, and balanced slides are of Siemens-Martin steel, and the tappet is of phosphor-bronze. The handwheel in front adjusts the slide down to the top of the work before being notched. The steel driving clutch is connected by levers to the treadle and disengages immediately the foot pressure is released.

Floor space, 6 ft. by 3 ft. wide; weight, 2,500 lb.

Planer, Box, Six-Tool

White Machine Tool Co., Ltd., Halifax, England. [Vol. 72,p.250E.] 4.

This six-tool box planer was constructed for planing six cast-iron textile machine rails at one operation. It will plane work up to 4 ft. 8 in. wide by 3 ft. high by 15 ft. long, and the bed is 24 ft. long, the width of the table being 4 ft. Cutting speeds range from 30 to 120 ft. per min. for ordinary high-



speed cutting tools, and from 150 to 200 ft. per min. when using tungsten-carbide tools. Return speeds range from 150 to 200 ft. per min.

A supplementary slide with power feed motion is mounted on the cross-slide and carries the six tool-boxes. These can be moved laterally for position. Each tool-box has independent down feed by hand, and a relieving device is provided for lifting the tools on the return stroke. When the machine is operating at high speed an accelerating device is provided, so that the cutting tool enters the work at a very slow speed, being brought up to the top speed after the shock of entry has been overcome.

Floor space, 32 ft. long by 13 ft. wide; weight, 15 tons, and motor required, 20 hp.

Riveter, Electric, with Hydraulic-Pressure Control

Schiess-Defries A.G., Dusseldorf, Germany. [Vol.72,p. 262E.] 6.

Machines of this type are available for pressures up to 130 tons and with clearances from 10 in. to 16 ft. 6 in., as horizontal or vertical models. A flange motor is used, driving through a flywheel, friction coupling, wormgear, crankshaft and toggle levers to a pressure

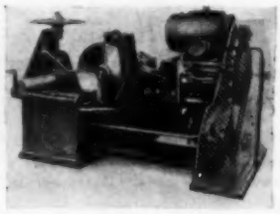
ram that actuates the riveting spindle. For pressure regulation, an hydraulic cushion is placed between the ram and the riveting spindle. By means of an adjustable roller stop, the spindle, after completion of the working stroke, is returned to its starting position or remains under pressure at the lowest position.

The machines are portable, but can be used as stationary types by employing a special loose base. For riveting in corners special tongs may be employed. The nine sizes are suitable for boiler rivets, hot, from ½ to 1¾ in. and have strokes from 2 in. to 4¾ in., the number of strokes being from 18 to 12 per min.

Sawing Machine

Buck & Hickman, Ltd., Whitechapel Road E., London, England. [Vol.72,p.329E.] 28.

The above concern is agent for this machine, built by C. Wicksteed & Co., Ltd., Kettering. The machine will cut 6¼-in. round sections, 6-in. squares, and 12x6-in. girders. Drive is by an electric motor through raw-hide pinion and gear wheel, or by belt with tight and loose pulleys. Power is transmitted through a simple



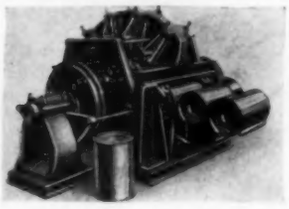
3-speed gearbox, and hydraulic feed from 0 to 12 in. is provided.

The vise, with renewable steel jaws, can grip both in the horizontal and vertical direction, and the work can be held up to an angle of 45 deg. with the saw face. Also a V-block is operated by a screw and travels in a lateral direction to hold round or square work. A movable end support for bars is carried on a frame supported by ball bearing rollers.

Seaming Machine, Automatic, for Drums

Joseph Rhodes & Sons, Ltd., Wakefield, England. [Vol.73, p.146E.] 88.

The high-speed flanging and double-seaming machine dispenses not only with the separate flanging machine, but also unnecessary handling of the drum bodies is avoided. The drums, with the ends in position, are simply rolled into the machine at one side, and come



out double-seamed at the other side.

The No. 60 model illustrated is the type in greatest demand, being specially designed for 5- to 10-gal. drums. The standard machine carries two pairs of chucks for double-seaming two drums simultaneously and has an output of approximately 4,800 drums per day of eight hours. Arranged with three pairs of chucks, it gives an output of approximately 5,600 drums per day.

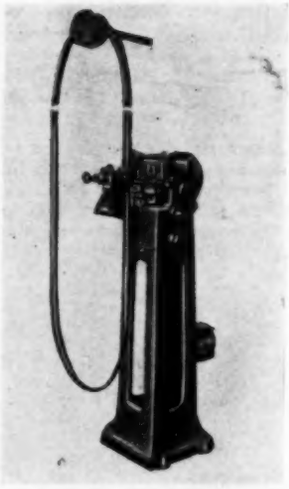
The mechanism is entirely automatic and the machine is allowed to run continuously. The rollers are housed in cast-steel arms and rotate on roller bearings. An important factor in the design of the machine is the overhead arrangement of the flanging and seaming rollers, due to which no trouble is experienced through the descaling of the sheet.

Sharpening and Setting Machine, Bandsaw, Automatic

Wadkin & Co., Leicester, England. [Vol.73,p.66E.] 62.

Bandsaws can be reconditioned completely on this machine, each tooth being sharpened to shape, and each tooth having the proper amount of set. The saw is hung vertically through the machine, and thus little floor space is required. Any length of saw can be handled, having a width not exceeding 2¼ in. and tooth pitch of ⅜ in. A standard three-cornered file is employed for sharpening, being carried in the sliding carriage. The cycle of operations is continuous, and the filing strokes are made at a rate of 75 per min. The file can be swiveled to give the required angle of tooth.

For the setting operations, the file is removed and an attachment, carrying a fulcrum and an adjustable hardened steel die with a V-shaped recess on the front face, is clamped on to the

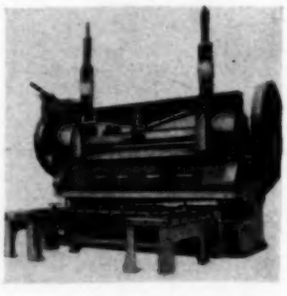


vise. Two faces of the die are brought into contact with consecutive teeth, setting them in opposite directions.

Shears, Guillotine

Scriven & Co., Leeds, England. [Vol.73,p.92E.] 73.

This guillotine shear is arranged for direct motor drive and will shear steel plate of 65 to 70 tons per sq.in. tensile up to 10 ft. wide and ½ in. thick, at any part of its length, or it will shear 16 in. from the edge of a plate of any length, the blades being made 12 ft. long



The cast-iron housings have a 16-in. gap. The shear slide is balanced by springs and works on machined faces on the housings. The slide is actuated by a forged steel eccentric shaft running in renewable cast-iron bushings. Drive is by spur gearing, flywheel, and direct-geared 25-hp. motor. A semi-automatic clutch stop motion, treadle-controlled, always brings the slide to rest at the top of the stroke.

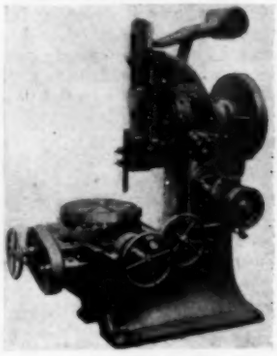
The machine is complete with a worktable and an adjustable squaring device. It occupies 18 ft. 8 in. by 13 ft. 6 in. and weighs 32½ tons.

Slotting Machine, Improved, 8-In.

Butler Machine Tool Co., Ltd., Halifax, England. [Vol. 73,p.55E.] 58.

Several improvements have been made in the 8, 10 and 12-in. slotters, of which the 8-in. size is illustrated. Drive

is now by belt from the line-shaft to a single pulley fitted with a friction clutch and outer supporting bracket. A brake is provided by means of a cone friction in the end supporting



bearing to stop the ram instantly in any desired position.

The improved speed-changing mechanism offers four speeds to the ram. The self-acting feed can be engaged or stopped, or selected, while the machine is in motion. The table screws have micrometer collars reading to 0.001 in.

Tapping Machine, Nut Automatic

Alfred de Fries, Kassel, Germany. [Vol.72,p.339E.] 34.

Cold- or hot-pressed nuts and bright nuts and brass nuts for the electrical industry can be tapped on these machines. In the range of six machines, the smallest will tap $\frac{1}{8}$ in. to $\frac{7}{16}$ in.

and the largest $\frac{3}{4}$ to 1 in. Each machine has two working spindles, with toolholders inclined to the horizontal plane. Bent taps are used. The blanks feed from a hopper. A device holds the nuts in position.

Small Tools

Bending Tool, Hand

S. Wolf & Co., Ltd., 115 Southwark St., London, S.E., England. [Vol.73,p.91E.] 71.

By the combination of a direct and compound lever action, light or heavy material can be dealt with by merely throwing a pawl in or out of action. The net weight is 100 lb., and yet

the device is capable of bending cold rounds and squares up to $\frac{3}{4}$ in. and flats up to $2\frac{7}{16}$ in. by $\frac{7}{16}$ in. By bending hot the capacity may be increased to $1\frac{7}{16}$ in. squares, $1\frac{7}{16}$ in. rounds, and $2\frac{7}{16}$ in. by $\frac{3}{4}$-in. flats.

Calipers, Roll

Churchill Machine Tool Co., Ltd., Broadheath, Manchester, England. [Vol.73,p.55E.] 59.

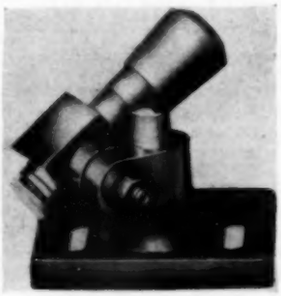
These calipers are designed for checking rolls, whether cambered or straight, and are available in two sizes, the smaller for rolls between 9 and 30 in. diam., while the larger is suit-

able for rolls between 15 in. and 40 in. diam., the maximum camber shown by the dial indicator in both instances being $\frac{1}{16}$ in.

Dressers for Precision Grinding Wheels

Wearden & Guylee, Ltd., Bradford, England. [Vol.73,p.134E.] 85.

This wheel dresser is fitted with a renewable silicon-carbide cup wheel as a substitute for a diamond. The cup-wheel spin-



dle is mounted on conical roller bearings, and is capable of running at 15,000 r.p.m. Three different sizes are made to suit requirements.

Dressers for Grinding Wheels

Wearden & Guylee, Ltd., Bradford, England. [Vol.73,p.176E.] 102.

Two sizes of dressers for grinding wheels are available, one being suitable for wheels of 12 in. and upwards and the other for wheels between 8 in. and 16 in. The larger appliance carries hardened steel cutting blades mounted in an inclined or

diagonal position, so that when the cutter rotates as a whole the cutting points move automatically across the face of the wheel.

Hacksaw, Hand-Type

James Neill & Co. (Sheffield), Ltd., Composite Steel Works, Sheffield, England. [Vol.72,p.302E.] 18.

This special hand hacksaw frame is adjustable to take blades from 8 to 12 in. long. It consists of two main parts, a tubular bow bend and a

C-shaped tubular grip. A die-pressed handle is secured to the grip.

Latch, Milling-Cutter

Clare-Collets, Ltd., Thomas St., Cheetham Hill, Manchester, England. [Vol.73,p.132E.] 83b.

This patent, non-creep latch for the shanks of milling cutters has a lip that prevents the cutter creeping in or out of the collet.

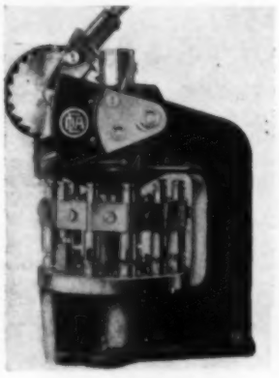
This latch is applied to solid-

shank cutters 3 in. diam. by 8 in. long having $1\frac{1}{4}$ in. shanks, down to $\frac{1}{4}$ in. side-and-end milling cutters.

Punch, Hand, Multiple, "Eda"

S. Wolf & Co., Ltd., Southwark St., London, S.E., England. [Vol.73,p.16E.] 43.

This tool is of the ratchet type for compound leverage and accommodates 12 punches with a range from $\frac{1}{4}$ to $\frac{3}{4}$ in. The thickness of material handled on this size is $\frac{3}{4}$ in. The body



rotates to bring any punch under the ram.

The dieholders are secured to lower disk, the hardened steel dies being removable.

Sleeves for Broken-Tang Drills

Wearden & Guylee, Ltd., Bradford, England. [Vol.73,p.106E.] 78.

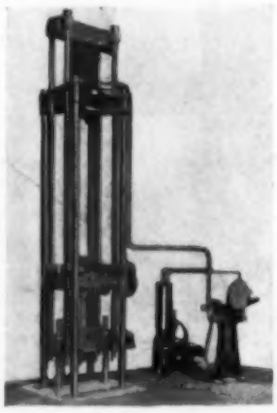
The sleeve is bored taper rather lower than usual and the slot is placed lower to correspond, but in other respects the sleeves are of ordinary form, and drills with new tangs ground on their ends can be driven in in the usual way. Distinctive markings are provided

Testing and Gaging Equipment

Testing Machine, Universal, 300,000-Lb.

Alfred J. Amsler & Co., Schaffhouse, Switzerland. [Vol.72,p.328E.] 27.

This 300,000-lb. tensile, compression, and transverse testing machine has a fixed crosshead on which stands a cylinder, the ram having a travel of 16 in. The movable frame consists of a top crosshead, to which four columns are secured, and a lower crosshead, which can be screwed up and down the columns. This crosshead contains the upper gripping head for tensile tests. For compression

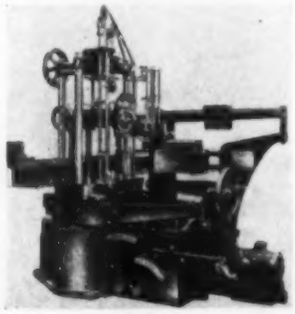


tests the lower compression tool is placed on this head, while the upper compression tool is suspended either directly from the fixed crosshead or, in the case of short specimens, from a prop. A lower or moving crosshead is used for carrying the beam, consisting of two girders, for transverse tests.

Testing Machine, Multi-Lever, 30,000-Lb.

Craven Bros. (Manchester), Ltd., Reddish, Stockport, England. [Vol.73,p.36E.] 53.

This 30,000-lb. Buckton multi-lever testing machine is for tension tests of specimens up to

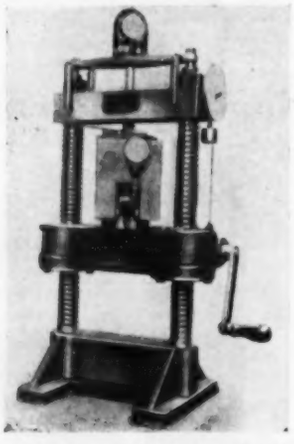


24 in., compression specimens up to 24 in., and deflection tests up to 36 in. The machine is of the three-screw type, driven by a 1½-hp. motor. Starting, stopping, and quick return motions are lever-controlled. Testing speeds are ¼, ½, and ¾ in. per min., with an adjusting speed at 6 in. per min.

Testing Machine, Transverse, for Cast Iron

Alfred J. Amsler & Co., Schaffhouse, Switzerland. [Vol. 73,p.174E.] 99.

This machine is designed primarily for transverse tests on cast-iron bars and is also suitable for other tests, as, for instance, Brinell hardness tests,

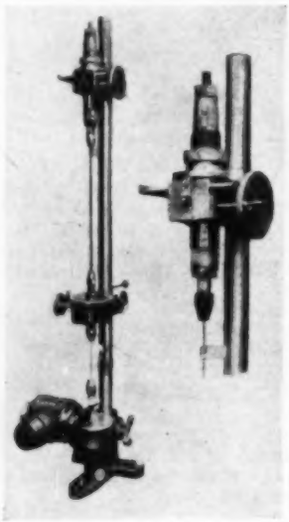


transverse tests of small prismatic cast-iron bars by the Frémont method, shearing tests, and other tests for which loads up to 2,000 kg., or 4,400 lb., are required.

Testing Machine for Thin Wire, Torsion

Alfred J. Amsler & Co., Schaffhouse, Switzerland. [Vol. 72,p.303E.] 19.

A maximum torsion moment of 50 kg. is provided on this machine arranged for both hand and motor drive. Torsion is read on a scale. A counting arrangement indicates the number of complete twists and parts thereof to which the wire is subjected.



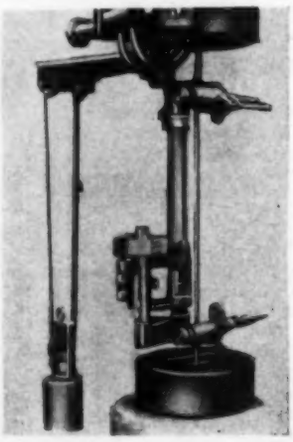
In the metric machine, the length of wire to be tested is either 50 mm. or 100 mm. Wires from the smallest diameter up to 3.5 mm. may be tested.

Extensometer, Recording

Alfred J. Amsler & Co., Schaffhouse, Switzerland. [Vol. 73,p.52E.] 57.

This recording extensometer magnifies 50 times the elongation of a round test bar to the diagram apparatus of a testing machine. The elongation can also be read directly on the instrument. The elongation is transmitted to the recording drum of the recording apparatus by means of a thread.

The instrument is supplied for

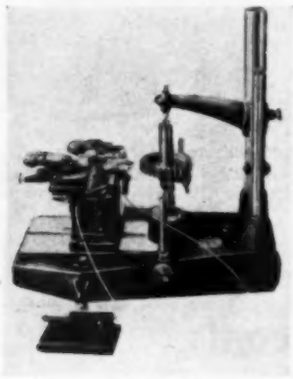


gage lengths of 10 in., 8 in., or 4 in., but cannot be supplied for shorter gage lengths than 4 in.

Gear-Testing Instrument

Dowdings' Machine Tool Co., Ltd., Albert Embankment, Vauxhall, S.E., England. [Vol.73,p. 68E.] 65.

This Zeiss instrument for testing gears—spur, spiral, bevel and worm—may be applied to the following varieties of measurement: (1) Uniformity of pitch along the base circle, using parallel measuring jaws, not considering eccentricity errors, (2) Size of tooth spaces by



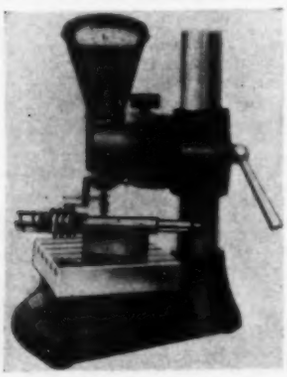
gaging with a ball-shaped feeler, and (3) Thickness of teeth by comparison, using a ball-shaped feeler.

Capacity, using parallel jaws, spur gears up to 25 deg. pressure angle, 25 d.p. to 5 d.p., 16 in. diam.; spiral gears up to 10 in. diam.; ball-shaped jaws, spur and bevel gears, 25 d.p. to 2½ d.p., 16 in. in diam.; similar spiral and worm gears, 10 in. diam.: measuring eccentricity, spur and bevel gears, 25 to 2½ d.p., 16 in. diam.; similar spiral and worm gears, up to 10 in. diameter.

Gage, Micro-Indicator

Société Genevoise, Ltd., Queen Victoria Street, E.C., London, England. [Vol.72,p.248E.] 2.

This gage works on a reference principle; that is, it is set up to a master and then shows any deviations from nominal size. The scale reads from 0.0001 to 0.0005 in., and is guar-



anteed to be accurate within 1 per cent of its range. Two index pointers on the dial show the permissible error.

Standard instruments are available with three different sectors. The first reads to 0.0001 in. per division and has a magnification of 500 to 1, the second has a like magnification, but reads to 0.0002 in. per division, and the third to 0.0005 in., the magnification being 150 to 1.

Gage, Snap, Indicating, "Passameter"

Dowdings' Machine Tool Co., Ltd., 38, Albert Embankment, Vauxhall, S.E., London, England. [Vol.72,p.318E.] 25.

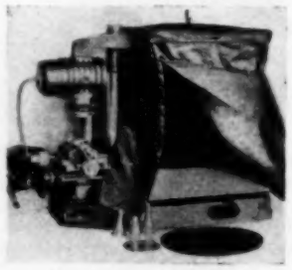
This "Passameter" indicating snap gage is made by Carl Zeiss, Jena, Germany, in six sizes to cover from 0 to 6 in. or 0 to 150 mm., inclusive. Indicating plug gages are called

"Passimeters." The snap gages have been completely redesigned and have steel bodies with aluminum covers. Fingers enamelled in red may be set to the limits required, and each of the intervals between the graduations on the scale represents from 0.0001 in. to 0.0005 in.

Projector, Toolroom

Dowdings' Machine Tool Co., Ltd., 38, Albert Embankment, Vauxhall, S.E., London, England. [Vol.72,p.263E.] 7.

This projector is suitable for testing templets, profile tools, screw threads, gear-tooth profiles, die castings and molds,



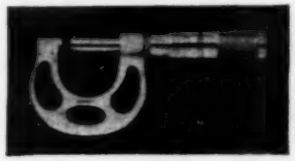
both for contour and size. Examination of contours is by comparing the projected image with a drawing enlarged on the same scale.

The size of object that can be examined is: ¾ in. with 25 diameters, ⅛ in. with 50 diameters, and 1/16 in. with 100 diameters.

Micrometers, External

Newall Engineering Co., Ltd., Queensway, Ponders End, Middlesex, England. [Vol.73,p. 119E.] 82.

A complete range of these external micrometers is being manufactured up to 12 in. They

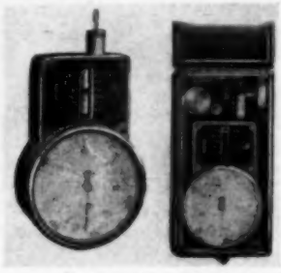


are available with or without a ratchet stop or locknut, and may be had to read by 0.001 in. or by 0.0001 in. All have bright steel frames, and standards for adjusting the instruments are available. Similar micrometers are available in metric sizes.

Tachometer, Hand, Wide-Range

Moul & Co., Ltd., Old Queen St., Westminster, S.W., England. [Vol.73,p.203E.] 110.

This hand tachometer is combined with an automatic change-gear for six speed ranges, the lowest being from 25 to 100



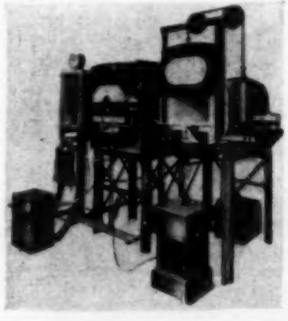
r.p.m. and the highest 7,500 to 30,000 r.p.m. The centrifugal principle of speed measurement is employed.

Miscellaneous Equipment

Furnace, Hardening, High-Speed

Wild-Barfield Electric Furnaces, Ltd., North Road, Holloway, N., England. [Vol.73,p. 92E.] 72.

This high-speed steel hardening and tempering equipment forms one complete production unit. The high-temperature hardening chamber at the left has internal dimensions of 15 in. long by 10 in. wide by 10 in.

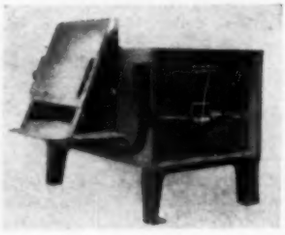


to the spring of the arched roof. The preheating and tempering chamber at the right is 24 in. long by 12 in. wide by 9 in. high. It may be used at 900 deg. C. for preheating and at 600 deg. C. for subsequent tempering.

Oil Burner for Stamping Furnaces

B. & S. Massey, Ltd., Openshaw, Manchester, England. [Vol.73,p.191E.] 107.

Features of this oil burner include simplicity, long life, and economy in air and oil consumption. An oil filter is an integral part of the burner, and is kept

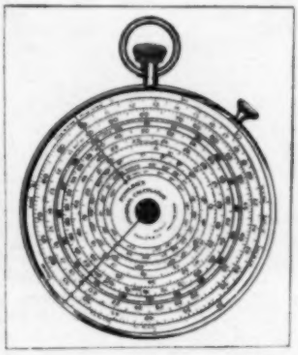


clean by the simple turning of a knob, without dismantling the burner or shutting down the furnace.

Calculator, Circular, Universal

Fowler & Co., 53, New Bailey St., Manchester, England. [Vol.73,p.15E.] 42.

The No. 1 scale is graduated logarithmically and clockwise and is used for multiplication and division. No. 2 is a reciprocal scale. No. 3 is a logarithm scale reading from giving four-figure values. Scale No. 4 is used for cubes and cube roots and also as a long scale for multiplication and division. Scale No. 5 is a scale of sines



giving values from 35 min. to 90 deg. Scale No. 6 is for tangents.

Detector for Cracks

Equipment & Engineering Co., Ltd., Norfolk St., London, W.C., England. [Vol.72,p. 278E.] 13.

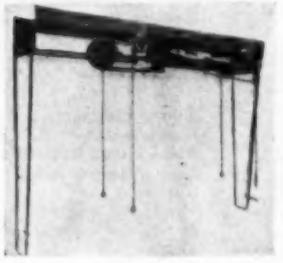
This magnetizer having movable pole limbs will take either long or short articles placed in the groove of the limbs. The specimen under test is mag-

netized, and if by immersion or otherwise it is covered with special detecting ink containing iron granules the latter will build up along any crack or similar flaw. The degree of magnetism can be adjusted. Direct current is necessary.

Hoist, Pneumatic

Globe Pneumatic Engineering Co., Ltd., 1 Victoria St., London, S.W., England. [Vol.72, p.329E.] 29.

The standard pneumatic hoist illustrated has the cylinder horizontal, whereas the vertical

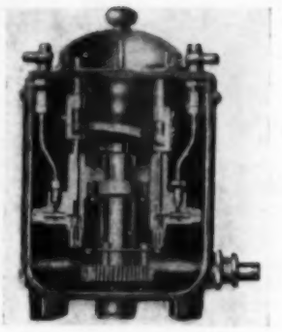


model is available for lifting heavy loads for short distances. The pneumatic cylinder unit is mounted in a carriage to run on an overhead gantry and lift a skip or platform by four ropes operating simultaneously.

Lubricator, Automatic

Railway and General Stores Contractors, Ltd., 24-27 Finsbury Court, Finsbury Pavement, London, E.C., England. [Vol. 72,p.340E.] 36.

This automatic lubricator consists of a series of small pumps set in circular formation and driven by a central gear from the machine. Each pump forms a separate oil feed and any number from 1 to 20 can be embodied. The feeds are set around the top of the body, and are independently adjustable. While running, the supply is self-accommodating to the variations of speed, even when this is very low.



Pneumatic Tool

Globe Pneumatic Engineering Co., Ltd., 1 Victoria St., London, S.W., England. [Vol.73, p.206E.] 114.

This vibrating pneumatic tool is particularly suited for removing oil paint from structures. It consists of a small valveless pneumatic hammer in which air ports in the cylinder wall are opened and closed by the piston

for producing a short but exceedingly rapid blow. Scaling is usually carried out by means of a small hammer at a rate of 10,000 blows per min.

Pulleys, Split

J. Hamilton & Sons, Ltd., Pollard St., Manchester, England. [Vol.73,p.134E.] 86.

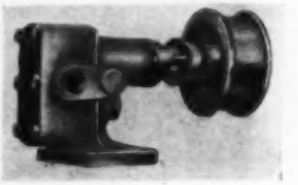
Split cast-iron pulleys are available from 3 to 10 in. diam., rising by steps of ½ in. up to

6 in. and by 1 in. up to 10 in., the faces being 3 to 12 in.

Pumps, Gear, Rotary

Henry Lindsay, 47 Queen's Rd., Bradford, England. [Vol. 73,p.190E.] 105.

Several standard sizes of these gear pumps are manufactured, the largest having a suction and delivery of 1¼ in. gas thread size with capacity of 945



gal. per hr. at 250 r.p.m. The smallest has a capacity of 48 gal. per hr. at 400 r.p.m.

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NEWS OF THE WEEK

Metal-Working Machinery Exports Surpass Previous Levels

UNITED STATES exports of industrial machinery are still well above normal levels, as shown by custom returns for the 11 months ending November, 1930, which have recently become available from the Industrial Machinery Division, Department of Commerce. Foreign shipments of strictly industrial machinery (excluding locomotives, small engines, etc.) for this period were valued at $206,943,000, less than the record volume in 1929 but greater than for any other similar period since 1921. This showing has been made in the face of a continuing decline in general exports.

Metal-working machinery has shown surprising strength, with exports for the eleven months of $40,006,000, exceeding the previous peak period of 1929 and surpassing the 1928 period by nearly 30 per cent. Items which were particularly active include the following, (figures for previous period in parenthesis): Foundry and molding equipment, $3,445,000 ($1,772,000), sheet and plate metal-working machines, $4,133,000 ($3,070,000), and drilling machines, $1,973,000 ($1,361,000).

Electrical Manufacturers Announce Program

A preliminary program has been announced for the 1931 Midwinter Meeting of the National Electrical Manufacturers Association, to be held in New York, Jan. 19-23. More than 30 meetings are planned for sections, groups, and committees. At a special dinner meeting on Tuesday, Jan. 20, there will be an address by President Clarence L. Collens and a speaker from outside the industry will discuss current economic conditions. A meeting of the Board of Governors is scheduled for Jan. 20, the Standards Committee for Jan. 22 and the Casualty & Fire Prevention Committee for Jan. 23. All meetings will be held at the Association headquarters or the Hotel Commodore.

Engineers to Aid In Unemployment Work

The engineering profession of the country, through the American Engineering Council, has undertaken to disclose the facts of unemployment and of relief effort, temporary and permanent, throughout American industry. "Regularization" of industry will be the keynote of the investigation, which will be directed by a committee of the A.S.M.E. Heading the committee is Ralph E. Flanders, Vice-President of the Society, and manager of the Jones & Lamson Machine Co. Other members are: Dexter S. Kimball, Dean of the College of Engineering in Cornell University, and a past president both of the Council and of the Society; Ely C. Hutchinson, Editor of *Power*, and a manager of the Society; Joseph W. Roe, professor of Industrial Engineering in New York University; Colonel C. H. Crawford, contracting engineer; Colonel W. A. Starrett, Vice-President of Starrett Bros. & Eken, Inc. Ex-officio members are the president of the Society, Roy V. Wright, and Calvin W. Rice, Secretary of the Society.

More than 100 subcommittees will be appointed, representing local sections of the American Society of Mechanical Engineers and the American Institute of Electrical Engineers. Both of these societies are included in the thirty national and local organizations which constitute the American Engineering Council, organized ten years ago under the leadership of Herbert Hoover.

Announce New Members Of Shop Practice Division

F. C. Spencer of the Westinghouse Electric Company has been appointed chairman of the Machine Shop Practice Division, A.S.M.E. to replace W. J. Peets of the Singer Manufacturing Co., who remains a member of the committee. Kenneth H. Condit, Editor of *American Machinist*, is retiring from the committee. New members appointed include Coleman Sellers, 3d, of the William Sellers Co., Philadelphia, Pa., and Benjamin P. Graves, chief engineer of the Brown & Sharpe Co., Providence, R. I. W. W. Tangeman, of the Cincinnati Milling Machine Co., is also a member of the committee.

OIL burner manufacturers will display their products at the eighth annual oil burner show in Philadelphia next April, 63 exhibitors having already taken space.

Grinding a 46-ton motor shaft, 34½ ft. long and 31⅛ in. diameter, at Westinghouse

PERSONALS

Ralph W. Burk, who for the past three years has been manager of the Detroit sales office, Kearney & Trecker Corporation, Milwaukee, Wis., has been promoted to the position of Sales Man-

ager, Eastern Division, with headquarters in Philadelphia, and will supervise sales in five Eastern territories. Mr. Burk will be succeeded in Detroit by F. G. Jackson, formerly district manager of the Philadelphia territory.

E. W. Brown has succeeded Charles Fell as general superintendent of the National Tube Co., Lorain, Ohio. Mr. Fell has retired after 48 years of continuous service.

James T. Cumming, recently appointed to the directorate of the Canadian National Railways, is president of the J. W. Cumming Manufacturing Co., New Glasgow, N. S. Mr. Cummings has taken a prominent part in the activities of the Canadian Manufacturers' Association and is, at the present time, chairman of the Maritime Division of the Association.

Harry W. King, head of the engineering department of the Morgan Engineering Co., recently resigned to become assistant vice-president of the Aetna-Standard Engineering Co., Youngstown, Ohio. Mr. King served many years as assistant to C. L. Taylor, formerly vice-president of the Morgan Engineering Co., and now will rejoin Mr. Taylor at Aetna-Standard in the same capacity.

Rudolph Klatt, who has been secretary of Western Malleables Inc., Beaver Dam, Wis., since its reorganization several years ago, has resigned. He will devote his entire time to the Beaver Silo & Box Manufacturing Co., and the Beaver Chemical Works in that city.

Karr Parker, formerly vice-president and treasurer of McCarthy Bros. & Ford, 75 West Mohawk St., Buffalo, has been elected president to succeed the late Edmond D. McCarthy.

Clifford F. Messinger has been elected president and general manager of the Chain Belt Co., Milwaukee. He was vice-president and general manager previously, and succeeds C. R. Messinger as president. The former president was elected chairman of the board, and on Jan. 1 became president of the Oliver Farm Equipment Co., Chicago.

R. R. Weddell, formerly chief engineer of the O. K. Tool Co., Shelton, Conn., has been appointed sales manager. E. Reaney will succeed Mr. Weddell as chief engineer. A. Curry has been appointed production manager to succeed Ole Severson, who is now in charge of all development and research work. H. Giller, formerly chief tool supervisor of the Chrysler Motor Car Co., is now representing the O. K. Tool Co., in the Detroit territory. He will be located at 5235 Buckingham Ave., Detroit, and will succeed J. Costello, who has been appointed assistant sales manager.

William R. Webster, Vice-President and Director, the Bridgeport Brass Co., will head the A.S.M.E. Research Committee during the coming year. He has been active in the brass industry for

more than 35 years. Mr. Webster's colleagues on the Committee are W. H. Fulweiler, chemical engineer, United Gas Improvement Co.; Alex D. Bailey, superintendent of generating stations, Commonwealth Edison Co.; and A. A. Potter, Dean, Schools of Engineering, Purdue University.

OBITUARIES

William Fletcher Barnes, 89, inventor of a clutch which solved difficulties of development of off-center principle machinery, founder of the W. F. & John Barnes Co., Rockford, Ill. in 1873, died on Dec. 28 in Rockford. He had lived in Rockford nearly 70 years. The development of his off-center machine clutch initiated a career of mechanical and industrial success, and the Barnes factory, launched first for manufacture of jig-saws, developed and expanded rapidly.

Albert S. Janin, 51, inventor of several types of airplanes and various airplane elements, died on Jan. 7 in New York City after a long illness.

Charles A. Anderson, 63, Vice-President of the Corry-Jamestown Manufacturing Corporation, Corry, Pa., died recently at his home in that city, following a heart attack.

William S. Bartholomew, 77, a leader in the development of mechanical stokers for locomotives, died in Pittsburgh on Jan. 6. Before his retirement three years ago, he was head of the Locomotive Stoker Co., a subsidiary of the Westinghouse Air Brake Co., and a vice-president of the latter.

I. S. Benjamin, 77, one of the best known foundrymen in New York state, died on Jan. 3 at his home in Middletown, N. Y., after an illness of more than a year.

George J. Henninger, 66, for the past 26 years general superintendent of the Attica, N. Y., plant of the Westinghouse Electric & Manufacturing Co., died on Dec. 30, after a brief illness. He had been general superintendent since the establishment of the Attica plant in 1905.

Ralph H. Plumb, 54, President of the Buffalo Bolt Co., Tonawanda, N. Y., died on Jan. 3 at his home in Buffalo after an illness of almost a year. He had been head of the bolt company for more than ten years.

Peter J. Smith, 67, Vice-President and formerly General Manager of the Manitoba Rolling Mill Co., died on Jan. 1 at Toronto.

William R. Wilson, 75, Philadelphia Branch Manager for the American Type Founders Co., Jersey City, N. J., died on Jan. 3 in Philadelphia. Mr. Wilson is said to have organized the first type-founding company in Baltimore in 1875.

John T. Witkin, 67, President of the Connersville (Ind.) Blower Co. Inc., for more than 12 years, died on Dec. 27 of heart paralysis. The company merged last February with two others.

FORTHCOMING MEETINGS

SOCIETY OF AUTOMOTIVE ENGINEERS —Annual meeting, Detroit, Jan. 19-23, 1931. John A. C. Warner, 29 West 39th St., New York, secretary.

STEEL FOUNDERS' SOCIETY OF AMERICA — Annual Meeting and Election, Jan. 29, Hotel Hollenden, Cleveland, Ohio. G. P. Rogers, Managing Director, 932 Graybar Bldg., New York City.

FIFTH MIDWESTERN POWER & ENGINEERING CONFERENCE AND EXPOSITION —Chicago, Feb. 10-14, 1931. G. E. Pfisterer, 53 West Jackson Blvd., Chicago, secretary.

WESTERN METAL CONGRESS AND EXPOSITION—Second National, Civic Auditorium, San Francisco, Calif., Feb. 16-20, 1931. Under auspices of A.S.S.T. W. H. Eisenman, secretary, 7016 Euclid Ave., Cleveland, Ohio.

THE INDUSTRIAL REVIEW

Weekly progress of the machinery and machine tool business

NEW YORK

Orders and inquiries both showed slight increases during last week. While dealers were inclined to minimize the advance, explaining it as simply the result of orders hanging fire for some time and scheduled for releases "after the first," the bettered conditions nevetheless created a great deal better feeling. Most of the orders were for single machines, some of them large. Inquiries were also for single items, principally for replacement. Railroads are expected to show more interest in the near future. The Pennsylvania has ordered 200,000 tons of rails, cost including fittings to be about $15,000,000. The D. & H. is to spend $1,250,000 on improvements in the near future.

SOUTHERN DISTRICT

Machinery and machine tool sales got off to a fair start the first of 1931. While the time is yet too early to make predictions, there is an expression of optimism over the outlook. Generally better activity is anticipated for the first three months of the year; this in face of an extremely poor November and December. Building and road contracts throughout the area lend promise of better upward movement, early reports indicate. Just how this will react toward the machinery and machine tool business is a matter of speculation, but at least there are fine prospects. The market has been clotted with used tools and equipment, and in some instances prices were off their customary levels.

CHICAGO

Manufacturers' representatives, distributors, and dealers find considerable encouragement in activities partially resumed by railroads and automobile builders, as indicated by the putting back to work of several thousand mechanics employed in their shops. On the part of the railroads it is stated that approximately 30,000 men have resumed work after a prolonged layoff. Reports are current that, following the the compiling of their annual budgets, several lists of tool requirements will be circulated by the railroads. Within the last week the Santa Fe has asked for bids on a crank-pin turning machine, a cut-off saw, a floor grinder, and a portable cylinder boring bar, this list, it is understood, being preliminary to others. The Milwaukee Board of School Directors is making inquiry for a number of tools for use in the schools' Department of Industrial Arts. Among these are included 8 drills, 3 grinders, and 6 lathes. Demand for used tools is reported inactive.

MILWAUKEE

Although 1931 is only a week old at this writing, reports from the local machinery and machine tool industry already show a decidedly favorable trend as compared to the last several months. There is, of course, some diversity of opinion regarding just how soon business will strike the normal stride, but it is quite generally agreed that inquiries and orders show a tangible trend in that direction.

While orders being placed are almost entirely for single tools or machinery, they are coming from a well diversified field. Running more to the standard types, this is taken to indicate expansion or replacement and to reflect healthy and substantial progress as compared to the previous business of scattered orders for special machinery. Some old inquiries also have been revived and orders placed. The used tool market is also somewhat more healthy than it has been for some time, dealers reporting occasional sales again.

OPTIMISM is becoming more evident in most of the country's machine tool markets, partly as a result of the arrival of the new year, partly because of increasing orders and inquiries. Dealers and manufacturers alike are fearful of making any predictions, continuing disappointments of the past several months contributing to their fears. All agree that orders will come as soon as business in general begins its rise, their readiness for the upturn indicated by the number of new equipment items in this number—37% above average and 11% above the next best similar period.

NEW YORK had some single orders for large units, and an increasing number for smaller ones. Southern District sales got off to a fair start after a poor November and December, though used tool clotting of the market is tending to lower their prices. Chicago hails the automobile and railroad production increases; several railroads being expected to inquire soon. The Santa Fe has a list out, as has the Milwaukee School Board. Milwaukee itself is also feeling better, even the used tool market showing larger sales. Detroit, with a slightly better level of general business, remains a mite pessimistic.

CLEVELAND reports some sales resulting from Studebaker orders, tool producers increasing their working forces, and an increase in inquiries. New England orders are up, though many are still of the promissory variety, and budgets seem to hold promise for the future. Philadelphia, even with orders from Baldwin, is still pessimistic, but hopes for railroad orders and a continuance of the general order upturn. Cincinnati hesitates to predict, though several manufacturers there, including a boring mill and a planer manufacturer, are feeling much better.

DETROIT

The outlook for the automobile industry is nebulous. The customary optimism of the manufacturer is still being manifested but sales are by no means so encouraging. Thousands of men were called back to work after the holiday season inventory and in some cases the factories increased their payrolls to a point substantially higher than the pre-inventory figures. The question now is whether the increase is likely to be more than temporary. If sales increase as the automobile makers seem to think they will, a demand for machinery and equipment is almost sure to follow.

The general business level is slightly better than it was during the last two month of 1930.

CLEVELAND

The machine tool industry as a whole is feeling better now that the holidays and the old year have departed. Although the first week of January was without feature, sales were up to expectations.

One dealer reports that small orders keep dribbling in consistently. Another reports an increase in inquiries from a greater range of buyers. One manufacturer is quoting on an automotive inquiry. Local manufacturers of auto parts, recent recipients of contracts from Studebaker, have bought a few tools to increase production. Increase in working forces by tool producers is also reported.

NEW ENGLAND

New England conditions seem a lot brighter without any particular display of activity. More orders for machinery were noted than a week ago. Apparently a turn has been made. However, machine tool orders are promissory rather than fact, and buying is no nearer normal than many a recent week; but promising factors develop to brighten the outlook.

Budgets indicate fuller buying programs from varied sources. Executives believe this will reflect improvement in machine tool orders shortly. Electrical manufacturers and utility companies plan heavy expenditures during the year. General Electric has an order for 4 generators from the Safe Harbor Waterpower Corporation totaling $20,000,000.

PHILADELPHIA

Optimism was at low tide among machinery and machine tool dealers during the last two weeks. No sales of importance were recorded and no prospect of an early return of business was apparent. The most hopeful of those who have been making forecasts estimate that it will be at least three months before there is a return to anything like normal conditions.

The Baldwin Locomotive Works has made some purchases of machinery and tools for replacement purposes at its Eddystone plant, and some purchases have been made for other plants in which Baldwin has an interest, but the aggregate was small.

There have been a few inquiries from among industrial establishments in the East and Middle West, but no indication that early buying will result from the requests received. Some of the hopeful dealers and manufacturers profess to see some railroad buying whenever the consolidation program is worked out. Meanwhile, those firms dealing with the railroads do not anticipate anything in the way of substantial buying from that source.

CINCINNATI

It is too early to see definite manifestations of impending trade revival, and business seems merely to drift along. Inquiries coming in create the feeling that the low point has been reached and that the sales curve is about to begin a gradual ascent. A marked exception to the remainder is a manufacturer of large boring mills, who states that the past year was the best in the company's history.

A manufacturer of planers stated that inquiries received in the past few days give a good deal of encouragement and expressed the opinion that there will be at least some improvement this month. Local selling agents report no important change in local and adjacent territory but feel that considerable business will be developed in the next few weeks from pending inquiries.

BUSINESS • BAROMETER

The situation in general seems to be improving, though progress is inclined to be slow

THEODORE H. PRICE
Editor, Commerce and Finance, New York

THE British Mathematical Association is an organization for which scientists have great respect. Sir Arthur Eddington is its president, and at the annual meeting held in London last week he delivered an address which many of his audience construed as a prediction that the end of the world is near at hand. Although this announcement was conspicuously featured by some important American papers, it created but little consternation on the stock exchanges, where news of happenings that were much less important caused pandemonium a little over a year ago.

The incident and the public reaction to it are impressive examples of what is called the psychology of the market. Sir Arthur Eddington is a scientist whose predictions are entitled to serious credence, but the irresponsible tipster who stands on the street corner and gives apocryphal advice for nothing gets more attention than Einstein or Aristotle would if the latter were alive today.

It is, nevertheless, true that the business men and speculators of the present generation are a little bit wiser than their forbears, and the annual reviews with which so many publications have hitherto been littered at this time of the year are briefer than they used to be. The futility of prophecy is recognized, and the worthlessness of any attempt to deduce the future from the past is more widely appreciated than at any time in the world's history.

Probably the present economic snarl will be untangled by some development that will provide work for all those who need it. Meantime, the 48 states that compose the Union, as well as the Federal Government itself, are using every agency at their command to get jobs for the jobless and relieve acute distress whenever it reveals itself.

So far as unemployment is concerned the following is a summary of the situation as given in the newspapers from day to day: In Great Britain it is now estimated that during the year 1931 the government will have spent nearly £1,000,000,000 sterling, or $5,000,000,000 in public works, and that most of this money will have been paid out for wages to those who are now receiving the dole. It is also expected that trade will be greatly improved by putting this amount of money into circulation, and that the result will be an increased activity of business in many lines.

In the United States, conditions are not dissimilar. The disposition to feature news that is optimistic has led to the obscuration of about a dozen bank failures in the Middle West and Southwest. But none of the banks affected were important, and several have been frozen almost solid for the past twelve or fourteen months.

A telegram from England, Arkansas, reports that about 500 men and women working on farms in the neighborhood came to town in a body, and demanded food from the local merchants. The answer to this demand was an immediate distribution of food from the stores and a promise that the Red Cross would care for their needs. The promptitude with which the situation was met seems to have satisfied the hungry farmers, but there is a possibility that the example set will be followed in several other communities that were also stricken by last summer's drought, and have nothing upon which to subsist until they can bring another crop to fruition. The ability with which the Red Cross is administered and its promptitude in dealing with such situations is re-assuring, but it is important to note that it is now conceded that those who need food have the right to take it.

Otherwise the domestic situation seems to be improving. The automobile manufacturers in Detroit have put about 30,000 men back to work, and say that a larger number will soon be re-employed. There seems to be some improvement in the demand for automobiles, and a better inquiry for most other forms of merchandise.

Distributive business is rather better than most people expected, but the figures of the holiday week are not significant, and it may be well to await later reports before assuming that our business policy should be governed by the statistics recently published.

Silver has been quoted at 13 7/16d. an ounce in London, and 28¼c. in New York. This is another new low record, as 14⅜d. was the bottom until the present decline started. That some action which will avert a further decline and the complete impoverishment of India and China will have to be taken is now self-evident. The subject is one that is already occupying the minds of many fiscal authorities on both sides of the Atlantic, and it is not too much to say that the future of our business in and with the Orient now depends upon two factors. One of these is our ability to prevent a further decline in agricultural staples. The other is our willingness as well as our ability to adopt a policy which will include some affirmative action in stabilizing the value of silver. To destroy its value will come very near to destroying the financial life blood of more than half the world's population. The situation is one which calls for immediate and constructive action on the part of the United States. If such action is taken a long period of profitable, constructive activity should follow.

THE BUSINESS WEEK

January 14, 1931

THINGS are pointed upward as the new year begins. . . . Business is getting back to the job and starting out vigorously to test the possibilities of improvement. . . . Workers are being recalled after shutdowns for holidays or inventory-taking. . . . Steel activity has rebounded sharply to the end of November level, with improved demand. . . . Automobile production continues the unusual rise that began in December. . . . Building contracts started the year at an encouraging level. . . . Most other indicators have ceased to decline. . . . Our index has moved almost horizontally for four weeks at nearly 77% of normal, and it looks more like the bottom than anything that this depression has so far exposed. . . . Commodity prices are stronger. . . . The stock market has begun to digest the first course of unpalatable earnings reports without signs of colic. . . . Most encouraging of all the familiar features of the bottom of this depression is the steady and rapid rise in bond prices since the middle of December. . . . But before we can kiss it good-bye, we shall have to see how far present Reserve policy of maintaining extremely low short-term money rates will be effective in lowering the cost of long-term borrowing and stimulating real investment here and abroad. . . . As soon as gold stops coming to this country and France, we can do so with enthusiasm.

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